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# AIRFIX

## magazine

VOLUME 1 NUMBER 9 MAY 1989



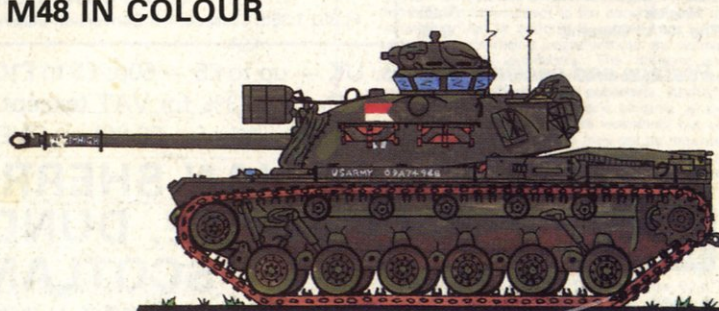
1:48th SCALE Bf 109s

TANK DIORAMA

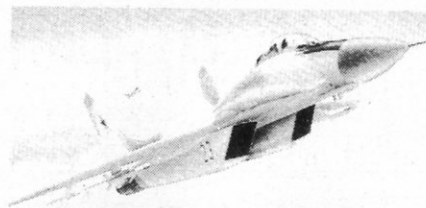
FIGURE PAINTING

BATTLEFIELD TAXI

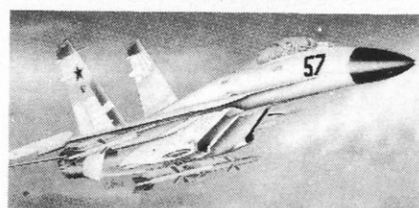
M48 IN COLOUR



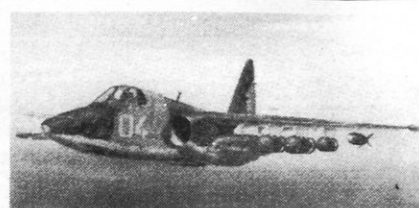




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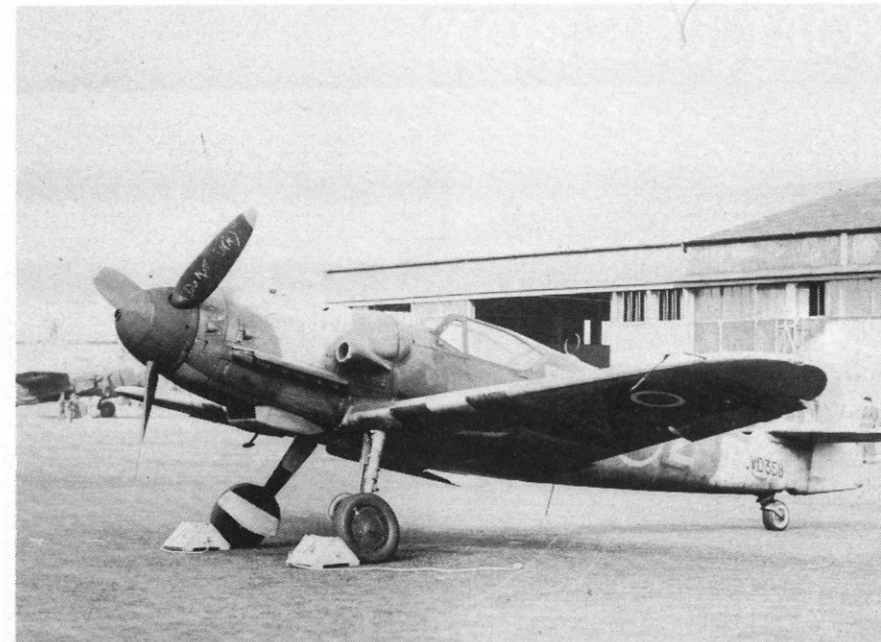
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A late model Bf 109G in England after the war. Note the 'invasion stripes'.

## A UNIVERSAL LANGUAGE

MUSIC has been described as a universal language. People of all the nations, races and creeds of this planet who are fortunate enough to have attained the skill of understanding written music and a resultant talent of converting the dots and scribbles into sound, are not required to be able to necessarily speak each others native language. It helps, but whenever musicians meet around the world, the obvious common musical notation is all that is needed for a small collection of these people to be able to achieve communication.

A recent trip to the Continent reminded me that the universality of our hobby, while perhaps not as common as that of music, is alive and well. Taking a break from the usual tourist routines, I sneaked away to a hobby shop, Trame, in Paris. Trame is a small shop at basement level, somewhat off the beaten track, with a wonderful compact collection of models, tools, accessories and books where the language of plastic (plastique) is spoken. Once down the staircase and through the portals, one enters that captivating atmosphere of rows and stacks of polystyrene and paper products that seem to quicken our collective pulses. The native French customers, oblivious to my browsing foreign presence, collecting the latest goodies from the well stocked shelves, were all engaged in an activity that could have been taking place in hundreds of shops on any Saturday morning in any city in the world.

They all were performing the well known ritualistic motions that the modelling community have now turned into an art form. Little did they know that my alien presence was aware that most of their now treasured and ambitious purchases would soon end up languishing in the lofts of their flats or chateaus.

My soul was immediately uplifted by this instant of international spiritual communication, but now after some reflection, I am pensive.

J.P.W.

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Cover: The MBB Bf 109 restoration about to land. (Photo: MBB)

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## STRAIGHT FROM THE BOX



# THE M48 TANK

THE name Patton conjures up differing images depending on your interests. To some it invokes the flamboyant US General 'Blood and Guts', to others a classic war film about his life and to AFV buffs it brings forth images of the US post war MBT series.

This article deals with the latter and is split into three sections. The first being historical, the second details the M48 family and the last being concerned with the building of Esci's interpretation of the M48 series.

### HISTORY

The US Army realised before the end of World War 2 that their main tank, the M4 Sherman was woefully outclassed against its opposition, but were reluctant to replace it due to its main saving grace: it could be churned out in huge numbers. However, the troops in the field didn't really appreciate this as

they were outgunned, out-armoured and vulnerable. This realisation led to the design and manufacture of a larger, more powerful vehicle, the

T26, which was as standardised as the M26 Pershing, a 45 ton tank armed with a 90 mm gun, the first of which was rushed to Europe in the last

months of the war for testing. It did not see much action but it proved combat worthy.

The Pershing was upgraded in the late 1940s as it was found

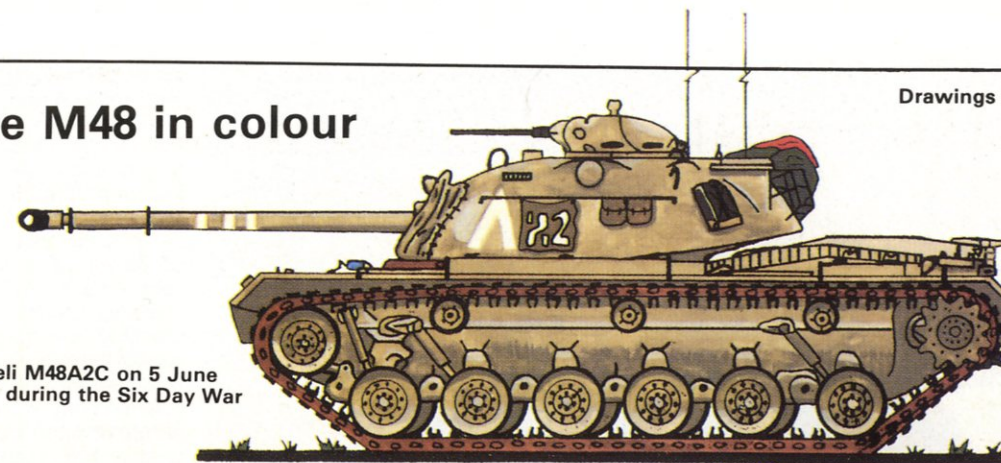


Above and right: The Budge Collection M48A4 at Bovington in 1987. (Photo: R. Fleming, Budge Collection)

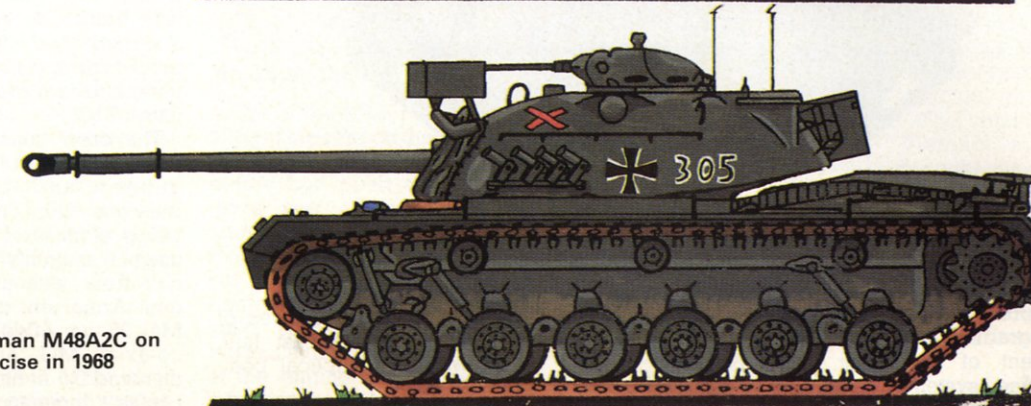
## The M48 in colour

Drawings by Mark Hazzard

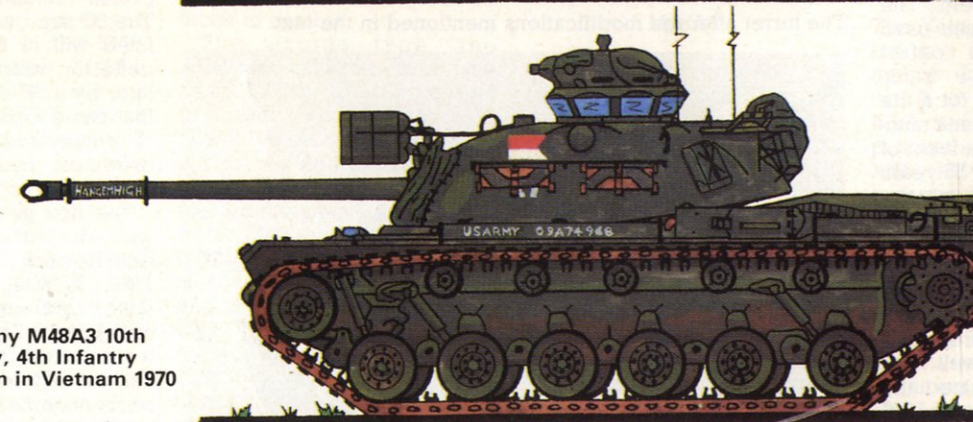
Israeli M48A2C on 5 June 1967 during the Six Day War



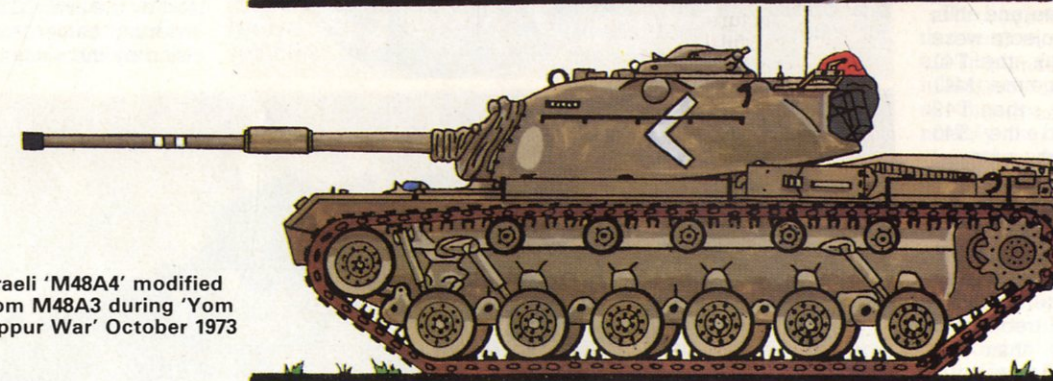
German M48A2C on exercise in 1968



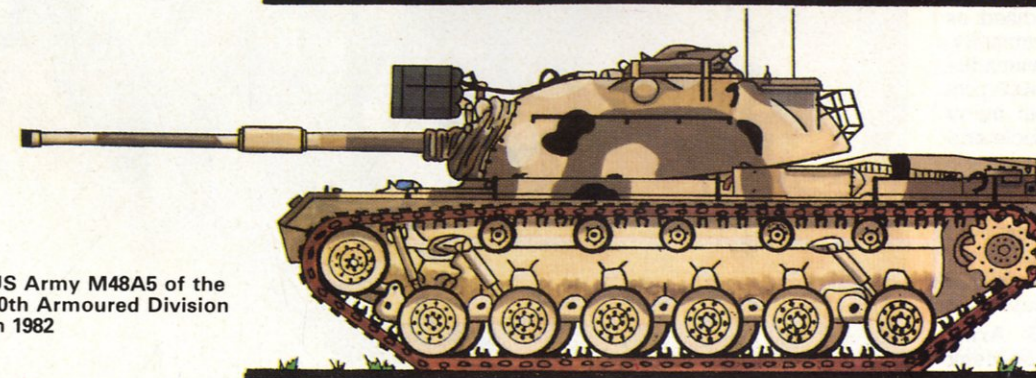
US Army M48A3 10th Cavalry, 4th Infantry Division in Vietnam 1970



Israeli 'M48A4' modified from M48A3 during 'Yom Kippur War' October 1973



US Army M48A5 of the 50th Armoured Division in 1982







A West German M48A2GA2 with 105 mm gun.

hull' section and the large 85 inch diameter turret ring, both inherited from the T43 project. This enabled a large gun to be carried and facilitated the employment of a well shaped, roomy turret. The engine and transmission was that used in the M47 and the stereoscopic range finding equipment was retained as well. A totally new running gear was installed consisting of six road wheels using torsion bar suspension fitted with friction shock absorbers. The track used was of a rubber block type and used a chevron pattern tread and was designated T107.

The crew consisted of four men: commander, loader, gunner and driver, the previous fifth crew member being eliminated allowed the use of a smoothly rounded cast hull front without a machine gun. Armament consisted of a M41 90 mm rifled gun, a 0.3 in co-axial MG and a pintle mounted 0.5 in fitted to the low profile commanders cupola. The 90 mm gun was originally fitted with a cylindrical blast deflector, which was replaced later by a 'T'-shaped deflector that came in two patterns; the 'T' shape and 'Y' shape (see drawings), both types can be seen on photographs of M48s.

The first production vehicle was delivered by Chrysler from Newark Delaware in April 1952. It was christened the Patton by George Patton's wife on 1 July 1952. Massive orders were placed, initially 1,348 and this was before the vehicle had been accepted and standardised by the army. The speed of ordering came from the decision by the army to have lots

to be underpowered, which isn't surprising when you consider the fact it had the same engine as the Sherman but weighed 10 tons more. Further facets of the upgrading involved replacement of the transmission, braking system and fire control system. The engine and transmission used were the AV1790-1 petrol engine and CD850-1 transmission, which would form the basis of all American tank automotive units until the advent of the M1 Abrams nearly 35 years later. This improved vehicle, first called M26E2, was standardised as the M46 and nicknamed 'General Patton'. Both of these tanks (the M26 and M46) saw action against communist forces in Korea and acquitted themselves well.

This conflict highlighted the deplorable state of the US Army's tank reserve and thus three new tank projects were started: a light tank, the T41 (which resulted in the M41 Walker Bulldog), the T42 medium tank and the T43 heavy tank, which entered service as the M103. The T42 project was found to be underpowered and it was decided to replace the turret of the T46 with that of the T42, which used a new accurate stereoscopic range finder and offered better ballistic protection than the M46 turret, the resulting hybrid being standardised as the M47 Patton. Unfortunately, due to the haste with which the development of the M47 proceeded, there were many problems with the vehicle and it never lived up to its expectations. Nevertheless, the vehicle was exported to many countries and eventually over 8,000 were sent abroad.

It was always recognised that the M47 was a stop gap. The completed US Army M48A5 with new engine deck and air filters.

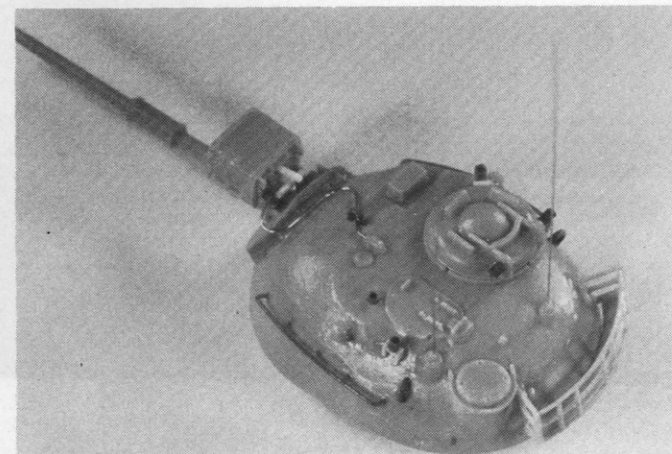
measure and it was decided to scale down the M103 design to produce a new medium tank, designated the T48 Patton. The contract was placed in December 1950 with Chrysler and the first prototype was running

within one year.

#### THE M48 PATTON MBT

The most unusual features of the T48 were the cast hull, which was of an elliptical 'boat-

The turret after the modifications mentioned in the text.

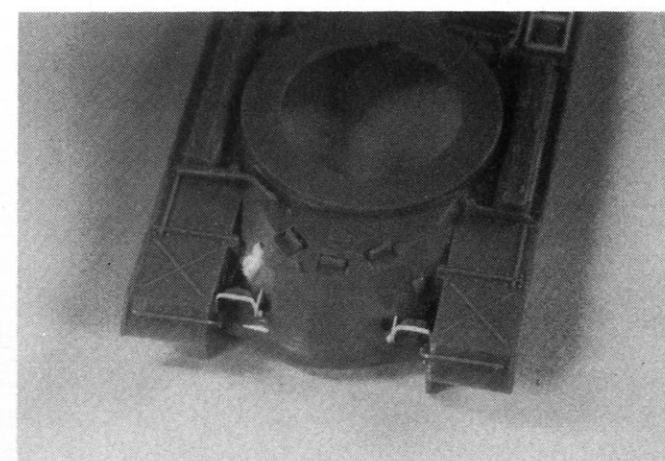


of tanks if the Korean War happened to drag on. This decision had grave results later.

The M48 as delivered differed markedly from the later versions. It can be assumed that the initial production batches of the M48, designated the M48 and M48A1 (which was a product improved M48) differ enough to warrant a separate article which I will do in greater detail in the future. Suffice to say that both initial versions suffered many defects, the most noticeable being an appallingly short range. With full fuel tanks this was 113 km (70 miles) using a 6.7 L/km (2.85 gal/mile) fuel consumption! This was alleviated somewhat by the installation of a set of external fuel tanks but still it remained poor. It must be said the same is true of many tanks of the era, so the Patton was not on its own.

#### M48A2

Mainly as a result of the short range of the vehicle it was decided to install a new engine and transmission in the M48. This project, called M48E1, was begun in October 1953 and used the AVI 1970-8 engine and XT-1400 transmission in a modified M48A1, the pilot vehicle being shipped to Fort Knox for testing. It was found that the transmission resulted in a severely reduced ground clearance which proved unacceptable to the army. It was decided to use an updated version of the CD850 transmission designated CD850-4B coupled with the new engine in a vehicle called T48A3, which proved to be a great success and more than doubled the



Modifying the headlamp guards is worth the effort.

range of the M48. The appearance of the rear on the tank was completely changed, where before had been a flat deck, there was a large 'box-like' hump with louvres each side. Exhaust gasses were passed out of two armoured louvred doors in the vertical rear of the tank. This new arrangement led to a much improved cooling of the engine and a reduced infra-red signature, a useful factor in combat.

The engine type, the AVI1790, differed from the basic AV1790 in that it was fuel injected, which improved power output from 810 hp to 825 hp, as well as slightly decreasing fuel consumption. All the improvements carried out on the M48 and M48A1 were incorporated. This tank was standardised as the M48A2 and was numerically the most important M48 version produced, going into production in 1955. The running gear on this version used a track tension idler and in general used three return rollers (although vehicles destined for the

USMC had five), the line of the fender guards was altered and a new design of headlights and guards was used (see drawings).

A derivative of this version is the M48A2C, which used a coincidence range finder instead of the stereoscopic one, the only external recognition feature being the lack of the tension idler.

#### M48A3

In 1956 information was obtained about the T54, which resulted in the superlative British L7 105 mm tank gun. Using this gun it was decided to update US tank design completely, eventually leading to the M60 series, the initial version of which bore a close resemblance to the M48 series. It used the L7 guns, and a new version of the engine designated AVDS 1790-2. This engine used diesel fuel which introduced fuel economy, decreased the fire hazard and standardised the logistics for the army.

It seemed logical to use as many components of the M60 as possible to upgrade the M48A1 tank which was done in 1960 and proved feasible. However, due to the large amounts of 90 mm ammunition held the 105 mm gun was not used. The engine bay was similar to the M48A2 but used a differing grille layout and had box-shaped side loading air filters on the fender guards. Distinguishing features of this version are five return rollers, the new engine deck and air filter boxes and deletion of the tension idler. Non visible improvements were also made to the suspension and fire control systems.

This version saw much use in Vietnam and that conflict brought many improvements to the M48A3 notably new brakes, an inflatable turret seal and improved driving controls. In addition many late models used the G305 turret riser device to improve commander visibility from the cupola.

#### M48A5

The Yom Kippur War of 1973 led to a dramatic drop in US tank strengths, so it was decided to further upgrade the M48 series with M60 components including the L7 (or M68) 105 mm gun. This programme involved all versions of the M48 but was obviously more involved on the earlier types of vehicles. The earlier versions requiring up to 67 conversion kits, with the M48A3 needing only 11. The time taken varied, with the M48A1 requiring four months and the M48A3 needing three.

The engine deck changed on this version, using top loading air filters and a repositioned infantry telephone box. External changes are many; most notably the 105 mm gun and revised mudguard pattern, the same as late Patton M48A3s.

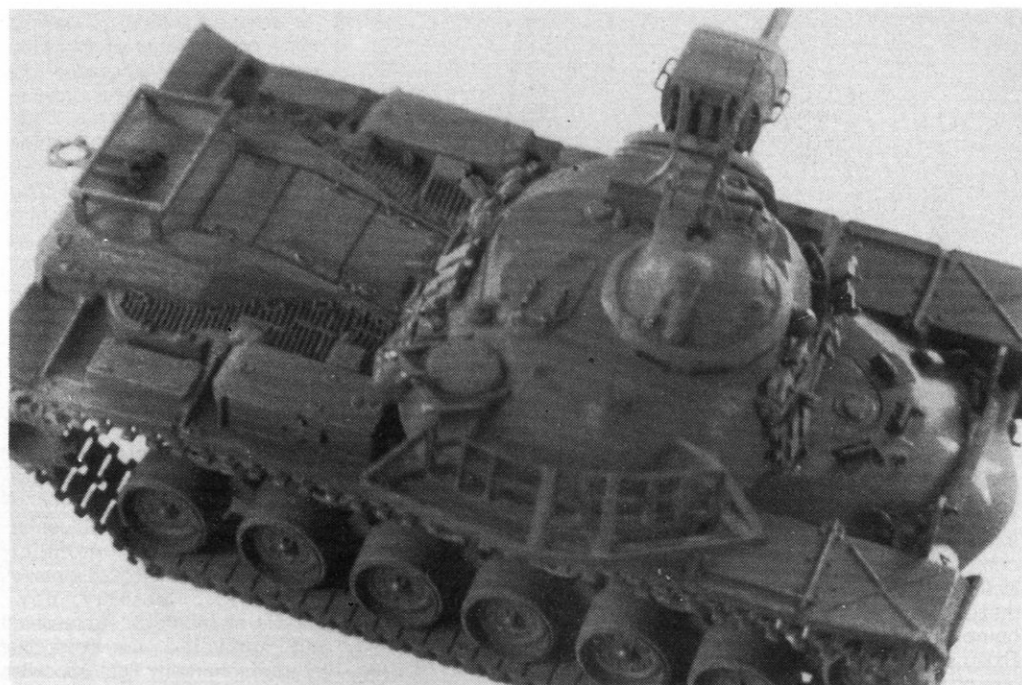
The M48A5 was produced in two distinct versions. The original batch used the G305 turret riser and M1 cupola, whilst the second batch used an imported low profile cupola, the 'Urdan' which was based on the Israeli tankers cupola in use since the early 1970s. This second version used two M60D pintle mounted MGs on the roof and was designated M48A5 (low profile).

Other changes made to the vehicle were the shape of the rear light guards from oval to flat top, a new gun lock for the 105 mm gun and five return rollers. The original track type, the T107, was replaced with the new T142 octagonal block

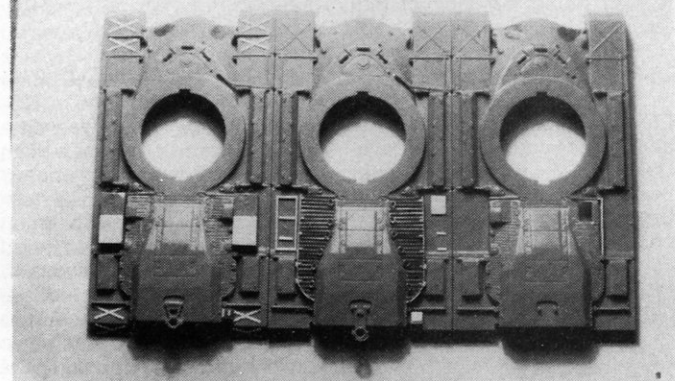
A US Army M48A2 in Korean War markings.







chargers fitted up the cupola roof.



Compare the engine decks (left to right) M48A5, M48A2C and M48AC.

track, which uses replaceable pads and improves the ride of the vehicle.

By 1976 the M48A5 was being shipped to National Guard units and battalions in Korea. This version has been used as a conversion kit in many countries including Korea, Turkey, Greece and Portugal.

#### FOREIGN VERSIONS

Many countries have modified their M48s most notably the Germans, Israelis and South Koreans.

The German Army or Bundeswehr received M48A2Cs in the 1960s and fitted smoke dischargers and a new AEG Telefunken searchlight to the turret, as well as adding a storage box for the latter on the rear of the turret.

A far more radical upgrade was the M48A2GA2, an M48A2C carrying the L7 105 mm gun. This conversion was carried out by Wegmann Industries of Kassel and necessitated the fitting of a totally new

mantlet, cupola and searchlight box. The programme resulted in over 600 vehicles being converted and most were distributed to reserve units. There is some talk of fitting the German 120 mm smooth bore gun to the vehicle to increase fire power and to help commonality with Leopard 2 and M1A1 Abrams tanks.

The Israelis have large quantities of M48A2Cs and M48A3s with the first being delivered in the early 1960s, mainly as war repayments from West Germany. In the early 1970s the majority of their fleet was upgraded to M48A5 (low profile) standards and were actually used as the basis for the later American upgrade, both M48A2C and A3 versions being upgraded. This version is called the 'M48A4' but this is on unofficial designation only. Some have now been fitted with 'Blazer' active armour panels.

The South Korean Army uses M48A3 and A5 versions. The A5s being unusual in using side skirts and having smoke dis-

Note the additions to this M48A3.

to be desired.

Each kit is fundamentally the same, but contains a separate sprue providing differing parts for each specific version. It looks as if the basic hull, turret and running gear is based on the M48A3 and while this is OK for a model of the A5 or A3, it is wrong for the earlier A2 derived versions.

As stated before the engine compartment on the A2 variants is different from the later versions and this difference detracts from the finished models and certainly benefits from correction. Apart from this and the old Esci bugbear of no guide teeth and drum wheels the kits are very nice and will make into good representations of the M48. Obviously there are, as with all kits, some improvements to be made. Some of these are general but most are specific to particular versions of the kit and I shall detail these in chronological order of the variant depicted.

#### GENERAL COMMENTS

I have included a flow chart identifying salient points of each major version including 'A4' and 'A2GA2', this should enable you to identify any photograph of the M48.

If you wish to see an M48 in the UK there are two. The Tank Museum at Bovington has a very early M48, actually a T48 prototype, whilst the Budge Collection has a magnificent 'M48A4' converted from a M48A3. This vehicle was captured in 1973 and brought to the UK a few years ago. It is fully operational and shows all the points of the late M48 series.

The drawings should be self explanatory. I have included a plan of the M48A2C which has scrap views of the A3 and A5 engine decks showing the variation in filter boxes. The A5 turret plan shows the 'Urdan' cupola and VVS-2 searchlight which was a standard feature on M48A3 and A5 versions. There is also a drawing of the tension idler on the M48A2.

#### THE ESCI M48 KITS

Esci seem to have a consistent policy of releasing kits of post war MBTs. This policy led to the production last year of a range of models of the M48 Patton series. Five models are available: the M48A2, M48A2C, M48A2GA2, M48A3 and M48A5 (low profile). These are up to Esci's general standard; well moulded with no flash being apparent. Unfortunately, as with some other of their recent releases, their accuracy can leave something

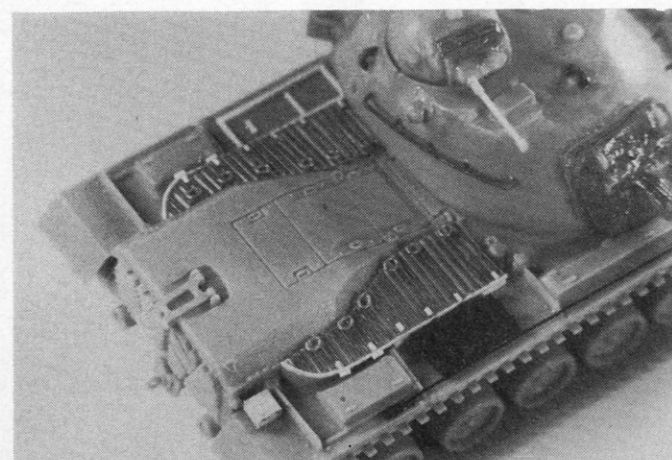
#### GENERAL CORRECTIONS

The general comments apply to moulding limitations rather than inaccuracies. There are five lifting eyes to be added, three on the turret and two on the forward hull. I drilled out their location points using an 0.5 mm drill in a pin vice and made the eyes from 0.5 mm plastic rod bent to shape.

A similar problem that is apparent with all the versions is that of over thick grab handles on the side of the turret, these were replaced with plastic rod, again predrilling the location holes. This helps to give the impression of properly fitting rails.

The locating positions for the headlights (in all models apart from the A3) are wrong as they are too near the centre of the vehicle. Fill these holes and re-drill about 3 mm further out-board. It is necessary to scratchbuild headlight guards for these lights. Mine were made from 10 x 20 thou Slaters strip wrapped round a suitably shaped former and then plunged in boiling water to pre-form their shape. After cooling under the cold tap, the light guards were cut off the former and superglued to the hull. The drawings show the two patterns used. The round patterns are supplied in the M48A3 kit.

Some problems may be encountered when assembling the running gear on these kits, so I used superglue throughout. Dangerous some would say, but the speed of assembly is certainly quickened and this is very obvious when assembling



A close-up of the modified M48A2 engine deck.

ing the shock absorbers and return roller mountings (parts 28, 20 and 23). I am still undecided about Esci's representation of the trackwork. I prefer flexible well detailed track to hard bare track. The M48 family has very distinctive and visible trackwork, but the Esci effort does not capture this effect accurately. However, apart from tedious work like building guide teeth and interior track detail to put it right there is not much that can be done.

Filler needs to be used in some places, notably the front and rear horizontal hull joints as these are none too well fitting. Make sure there is no join line in these places as it will really show. Other problem areas can be the turret halves, especially around the rear.

#### MAKING THE M48A2 MODEL

The M48A2 is the earliest version depicted in model form so I will deal with this first. The major work required on this

model is the construction of a totally new engine deck, the one in the kit is for the diesel engined variants of the M48. This is not as hard or as tedious as it sounds if 100 per cent accuracy is not required. The slope of the grille work on the early models of M48s is similar to the later versions and the actual 'hump' is the same so that certainly helps things out. All that is needed is a new set of louvres added to the modified rear deck.

The first thing to do is to cut off all the raised detail on the engine decks of part No.1. This requires some deft scalpel work and please be very careful as a slip here can be nasty to ones fingers! Alternatively if you own a mini drill use a grinding wheel to remove the detail in this area.

The basic idea is to graft two new grille sections on top of the now cut down kit parts. This is where the fun begins as the grilles have to be scratchbuilt. I constructed mine from five thou sheet, 20 thou (0.5 mm) rod

and some copper chain. First add two tapered vertical side walls to the mudguards, these form the outer edge of the decking. In reality these are curved slightly towards the front of the vehicle and for ease of construction I built them straight. Next cut two identical pieces of five thou plastic card (or 10 thou if five is unavailable) to the shape in the drawings. Make sure both pieces are identical because it will really show if they are not. All the grilles have to be added next, use either 20 thou rod or 20 x 20 thou strip. I sellotaped my engine deck panels side by side before glueing a strip across both panels at once. This enables you to get the same spacing and number of grilles on each engine deck. The surplus can be cut off when all are in place. The sellotape can then be removed giving you two identical decks. I glued these into position on the cut down panels, making sure that they joined up with the side walls. Leave alone to dry!

While these were drying I started work on the turret. As I have purely static models, I glued the gun barrel and mantlet in place. This leaves a large gap between mantlet and turret which in reality is covered with a flexible cover. Rather than fill this with a high-tech filler such as Milliput I used plasticene. I find that this works fine and can be easily worked and removable if necessary. To give a good surface to paint later I coated it in Sproo, a kind of thin liquid polystyrene that can be painted on with a paint brush (I find it works best if thinned with Mekpak). After adding the stowage basket, this just about

completes the sub-assembly. The MG cupola also has a mantlet added from plasticene to fill the gap on it.

Meanwhile back to the engine decks, the engine deck is about 75 per cent complete but requires some extra detail. This was added from strip to represent the hinges and outer edge. Time and patience will be repaid here. All that needs to be added are the deck lifting handles. Rather than scratch build these I used individual links of Slaters fine copper chain superglued in place. There are six per side in all. All that needs to be added is the infantry telephone on the rear right mudguard, a tool box on the right mudguard and a tool stowage rack on the left. Lights are added as mentioned before and the top mated to the chassis. This requires no work apart from general filling and careful construction. I assembled the whole kit before painting. I usually undercoat my models with a light coat of car primer, making sure it is a light coat as a heavy one will attack the plastic.

This particular vehicle is illustrated on page nine of *Modern American Armour* and is on exercise in Korea. It is olive drab with a camouflage pattern of mud on it. This was achieved using a thinned down coat of dark earth brown after the markings had been applied. All of the above work is necessary as the other two M48A2 variants.

#### THE M48A2C LIT

This kit is identical to the first M48A2 kit and all the work carried out above is repeated on this model. However, there are some variations. This vehicle is illustrated on page 36 of *M48 in Action* and has a 'Y' pattern muzzle brake and a large mantlet cover. The mantlet cover is again made from plasticene covered in Sproo and extends part of the way along the barrel. The new muzzle brake is made from a drilled bent piece of plastic tube.

I chose to model a vehicle used in the 1967 Six Day War. These vehicles were extensively stowed and had large hand-painted Tac markings on the turret walls. The stowage is plasticene lumps covered in toilet paper. These are placed in the stowage basket and painted using thinned dark earth acrylic paint. The model is painted in 'sand grey' for which I used Humbrol HM8 enamel paint. All towing links, lifting eyes and the muzzle

An M48A3 in Vietnam War markings.



# An Israeli M48A2C in typical desert markings.

brake are painted black as are the jerry cans.

The tactical symbols on the turret walls are handpainted (as on the actual tank) and if they look a little crude this is acceptable as they were sometimes very rough. All Israeli vehicles during this conflict carried an air recognition panel on the turret rear because of Israeli air superiority. This normally consisted of a bright piece of parachute silk, normally scarlet or lemon yellow. Again toilet paper is used. In this case, I painted it using red acrylic. It certainly highlights an otherwise drab model. Please bear in mind that these vehicles were not equipped for searchlight fittings so remove the small oval lump on the turret roof and fill the two holes in the mantlet.



## THE M48A3 KIT

Chronologically this was the first diesel engined version and it saw extensive use in

Vietnam with most people associating the M48 with this conflict. Many small changes were made to the M48A3 in service and this model is rep-

resentative of a typical M48A3 used. It was built by Kevin Dennigan who is much more knowledgeable about the Vietnam War than I, so he offered

to build it for this article.

As can be seen there are many small easy alterations to this kit which comes with bulged cupola and G305 turret

riser as well as extra return rollers, round pattern headlight groundspace and side loading air filters. At least this kit requires no engine deck work as it is correct on this model. Again this vehicle is illustrated in a book, *Tanks Illustrated* No.6, and in colour!

The additions can be summarised as a new stowage rack on the 'hump', an extended turret stowage basket, searchlight mounting on the turret ventilator housing and MG ammo box holder on the roof of the cupola. A piece of girder is fitted between the headlights to act as a brush guard. Extra track links are carried, these act as spaced armour and are attached to the grab rails. Finally the mud guards are cut down front and rear. A new searchlight mounting is required as the kit one is incorrect. The sketch of the searchlight should highlight the necessary additions. Most of these additions can be simply made using plastic strip. The searchlight is covered by a canvas cover made from 20 thou plastic card. Many of these vehicles had even more stowage than the Israeli versions. For further details of Vietnam operations of the M48 see Phil Greenwood's article in the January 1989 edition of this magazine.

from plasticene and Sproo. Construction is straightforward with the only addition to this model beyond the M48A2 model being the backing of the wing mirrors using 10 thou card. Care must be taken when assembling the smoke dischargers, I used superglue to achieve a fast result. This vehicle is not actually illustrated in any publication I have seen but looks fairly 'typical', with only the turret ID number varying.

## M48A5

The last American version of the M48 to see regular service, this variant requires some work to the mudguards. They are of the late pattern and need new 'X's adding from strip or rod. Their position should be apparent from the photographs of it under construction. For this model I used new pattern T142 track. This was obtained from an Esci M60A1 kit. The track from the M48 kit being more typical on an early M60A1, so nothing is lost. I also used the gun crutch from the M60 kit but this is not essential.

The kit provides parts for an M48A5 (low profile) and has an urdan cupola and a pintle mounted M60D machine gun that is probably best being thrown away, it really isn't very good. I used two normal M60s from the Minitanks MG set, although not strictly accurate they do convey the 'air' of the M60D.

Some work needs to be done on the turret which is to fill the hole between mantlet and

**All five models completed and compared (left to right) A2, A2C, A3, A2GA2 and A5.**

turret and to build three MG mounts using tube and strip. The Urdan cupola needs some work, while accurate in general shape, the detail at the rear is a little off and some carving and modification using rod helps to convey the image of the turret much better. This particular vehicle is illustrated on the back of *M48 in Action*, which also provides an illustration of the camouflage scheme. Note that this vehicle should have an M1 cupola and turret riser, not an Urdan! But by now its probably got one anyway, so no worries.

Again the searchlight mounting needs replacement and light guards added. The infantry telephone box is in a different position than on earlier versions and the air filter boxes can be improved by adding a piece of 20 thou card to the top rear half of each filter box. All the models use 10 thou rod as aerials and are washed using acrylic paints to highlight the details added.

## ADDENDA

As always with modelling new references come along or something is spotted that throws new light on a subject. I'll now detail the mistakes I've spotted since first building the models.

1. On M48A2 variants, the heater exhaust (part No.3) should go from right to left, not as I've done it from left to right. Just fill the hole in in part one and after adding a new junction replace it facing the other way as all M48A2 kits. It's OK for A3 and A5.

2. The rear lights on part No.4

on the M48A5 are the wrong shape and should be square topped not rounded, not very important I agree but again a detail worth correcting.

3. Again on the M48A5 there is a shelf running above the engine rear louvres. It follows the line of the 'hump' and is on the A5 deck plan.

4. All the models are in fact too tall by about 2 mm. This is easily rectified by shaving the corners off the stops on parts 19 and 46. This lowers the hull the correct amount. Kevin Dennigan did this on the M48A3 kit and it is quite apparent.

That sums up the M48 kits by Esci. With a little work they can produce very good models indeed and we have waited a long time for them. For those nutters amongst you, how about an M247 Sergeant York anti-aircraft tank based on the M48A5? It is feasible if combined with an M60A1 model. You only lose the M60A1 turret because the M48A5 turret grafted to the M60A1 hull with M48 track produces an M60. More on this later.

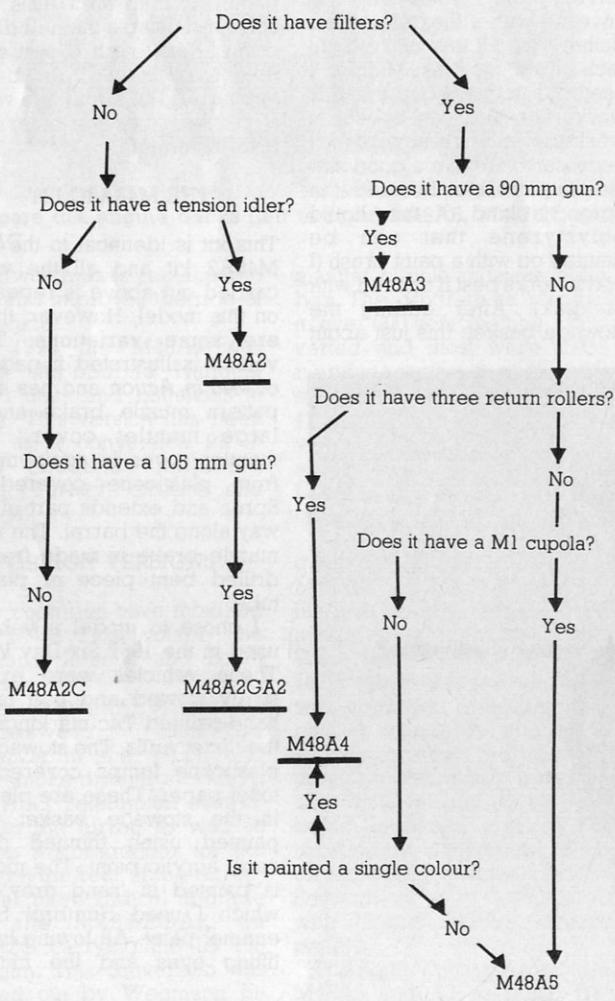
## REFERENCES

Essential references are:  
*M48 in Action* (Squadron Signal No.22), J. Mesko.  
*Modern American Armour* by S. Zaloga and J. Loop.  
*Tanks Illustrated* No.8, S. Zaloga.  
*Jane's MBTs* by C. Foss.  
*M60 in Action* (Squadron Signal No.21), J. Mesko.  
*Tankette* Vol.15 No.2.

**Acknowledgement:** The author would like to thank Bob Fleming for loan of the Budge Collection M48A4 photographs and to Kevin Dennigan for the work on the M48A3.

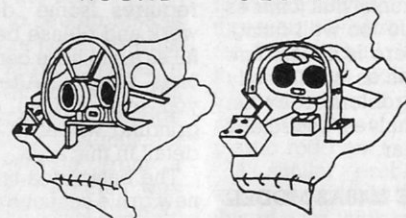
Mark Hazzard

## M48 Guide



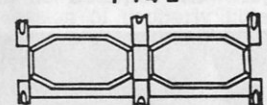
## LIGHT GUARDS

ROUND SQUARE

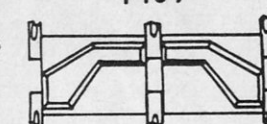


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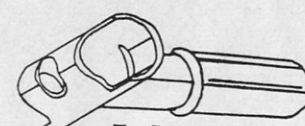
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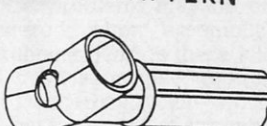
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## MUZZLE BRAKES

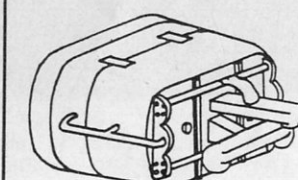


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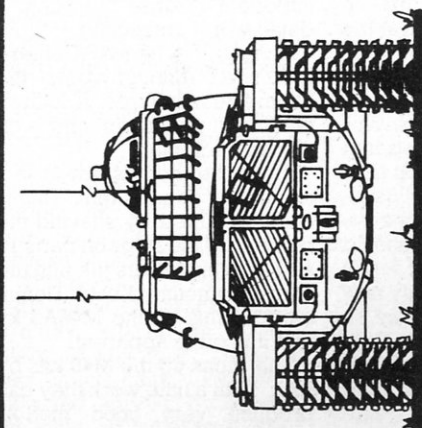


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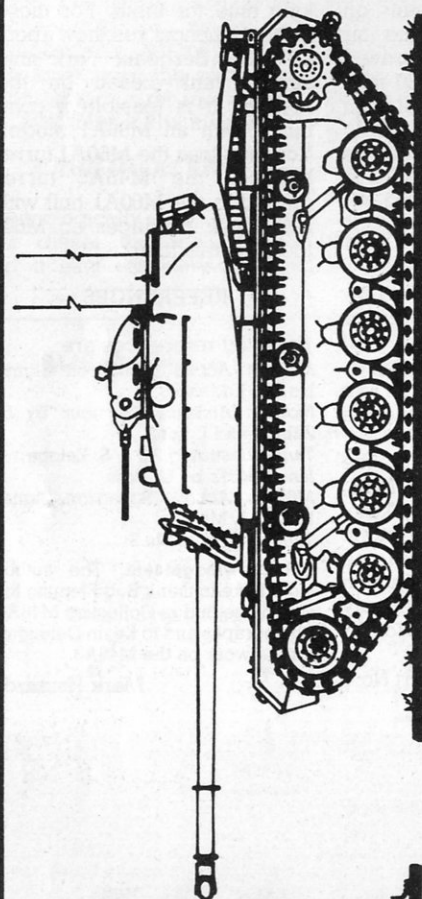
## VSS-2 SEARCHLIGHT



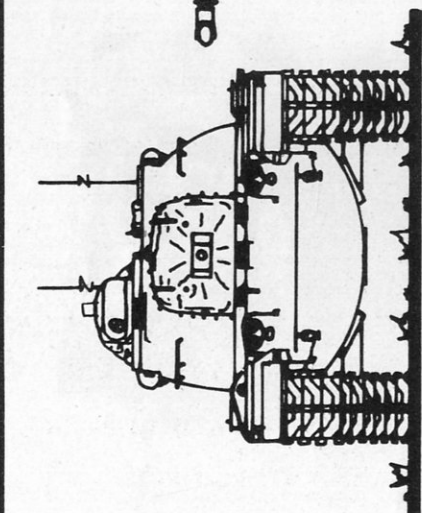




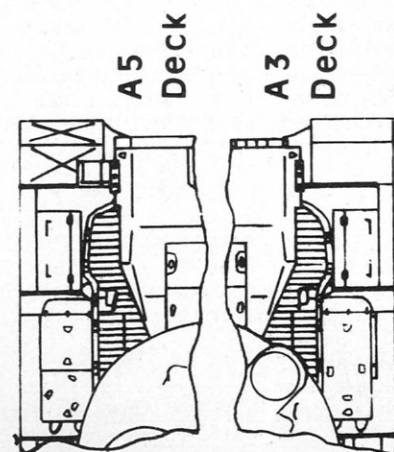
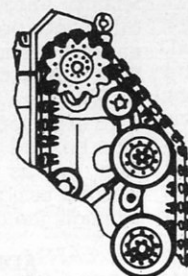
M48A2  
Track  
Tension  
Idler



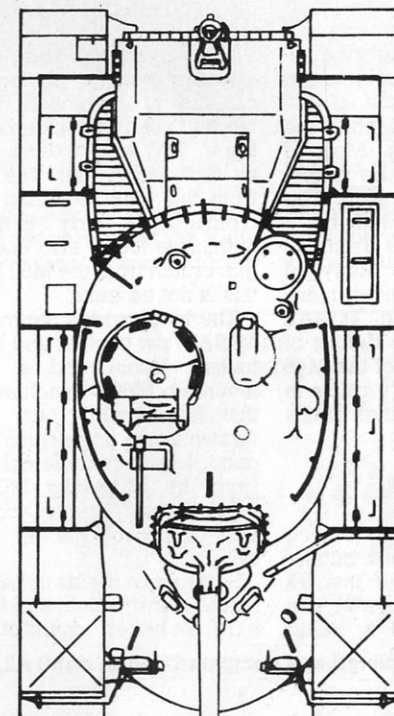
A5 Deck



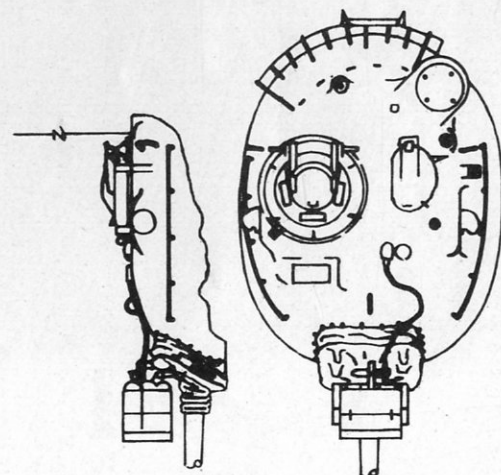
A3 Deck



A5 Deck  
A3 Deck



A5 turrett



Y Brake

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M48A2C  
PATTON &  
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1/72



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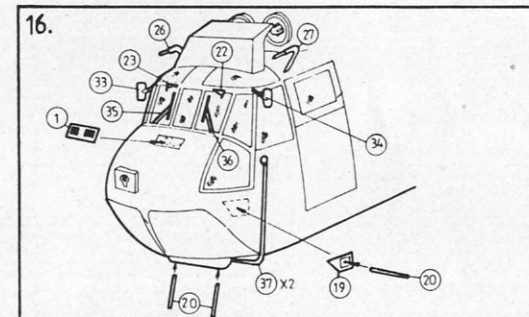
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# STRAIGHT FROM THE SECOND BOX



## Building the Airfix 1:48th scale Bf 109F

By J.P. Wood

WHILE this is the favoured scale of modellers in my native land, the USA, I have always, for reasons not completely known to me, preferred the slightly smaller kits to the more universal 1:72nd scale. Recently, the releases of a variety of kits of other versions (see Kitography in this issue) of the Bf 109 in 1:48th scale rekindled my interest in this Airfix kit of the 'Felix' variant of Willy Messerschmitt's ubiquitous World War 2 Luftwaffe fighter. The plastic model kit industry, by consciously or unconsciously producing models of virtually all the production versions of this historical German fighter, forced me into embarking on this project of building a mini-collection in this larger scale.

The 'F' version of the Bf 109, while not the most produced, was reputed to have been the favourite of all the many that were produced. As a former pilot, I can understand why and as a modeller, I would like to think that Airfix chose this variant for the same reasons. The Bf 109F was a quantum leap in technology from the 'E'

version and not only was it faster with its more powerful engine, but it was also more manoeuvrable. You just can't have two better features added to a fighter aircraft.

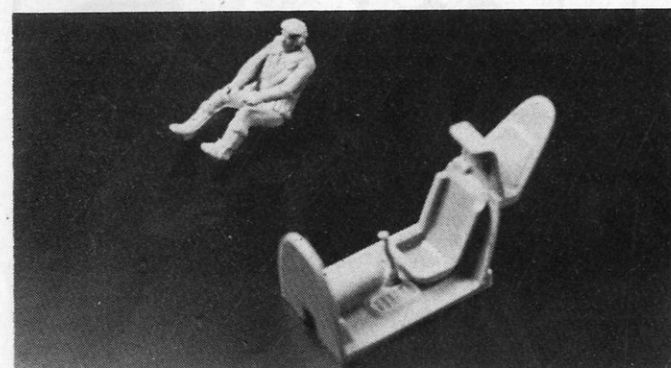
Subsequent '109s were all heavier and in some cases, better armed, but all were slower and more sluggish, made so by the continual addition of equipment and 'improvements' that only reduced its performance.

### THE KIT

I am not too sure when the Airfix kit was first released, but it does not show its age at all. The Airfix series of 1:48th scale kits have always been at the top of the line and this kit is no exception to that rule. It contains less parts than most kits to this scale, ensuring simple construction and all of the parts included are accurate and finely detailed. It even has a removable engine cowling that provides the more experienced modeller with an excellent opportunity to add a super-detailed engine compartment should he decide to do so.

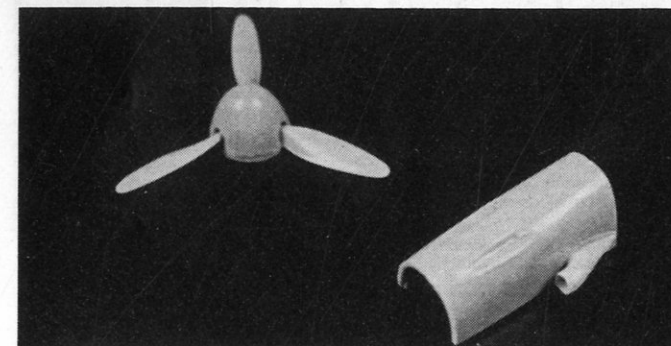
### Stage 1

The well printed and easy to follow Airfix instruction sheet begins with the assembly of the pilot and the cockpit interior. The pilot figure comes in three separate pieces and therefore his arms can be fixed in any position that you like should you decide to add him to your model or diorama. This, of course, is optional. The cockpit interior is simple but well appointed and should be painted at this time and set aside to dry before adding it to the fuselage.



### Stage 2

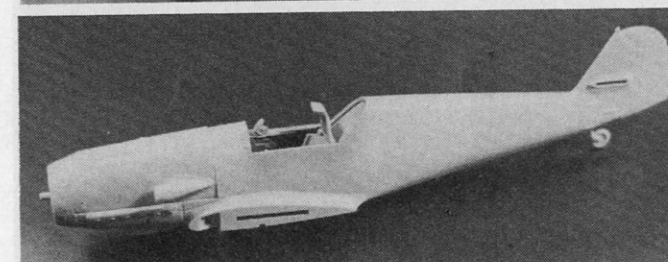
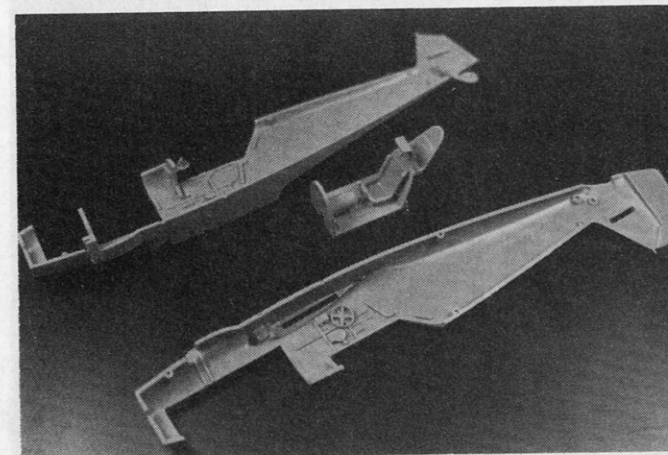
I accomplished steps three, four and a bit of six at this time in order to allow these sub-assemblies adequate time to dry before their addition to the main assembly. The propeller is moulded with the blades separate from the spinner and hub which is done to ensure the absolutely correct prop blade



section and washout angle. One piece propeller mouldings may be easier to assemble but are not quite as accurate. Care must be taken to ensure the correct 120 degree spacing of the three blades even though the kits engineering virtually prevents major mis-alignment. When adding the engine air intake to the cowling you must decide whether you want to add the optional tropical air filter at this stage. I opted for the standard intake.

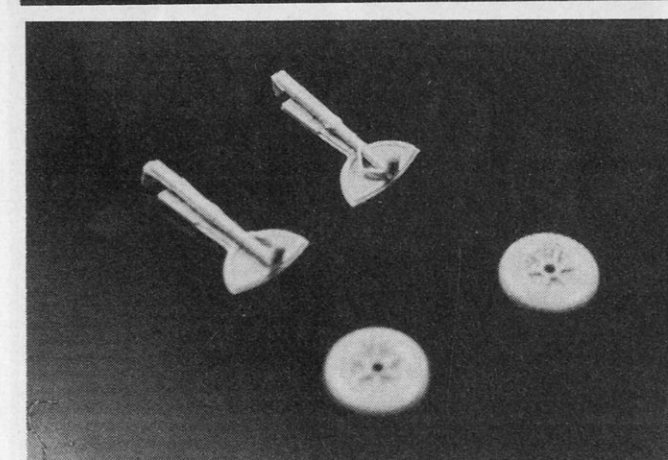
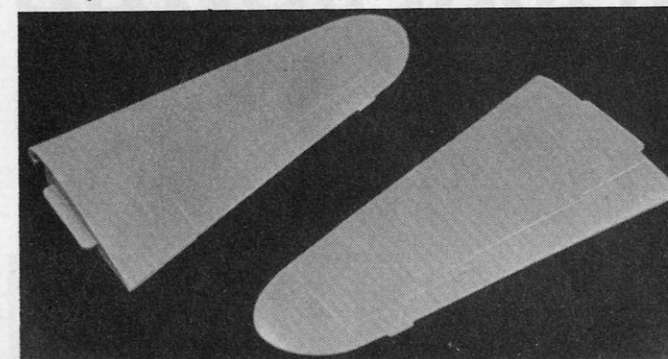
### Phase 3

The fuselage assembly takes place during this phase which includes steps five and six on the instructions. Before securing the fuselage halves together, paint all the details on the inside in the appropriate colours. The tailwheel can be installed either in the retracted or extended position, but don't forget to add it before securing the halves together. Another part that could inadvertently be omitted at this time is the oil cooler internal bit, part number 23. Do not overlook this as to do so could provide you with some unwanted frustration later.



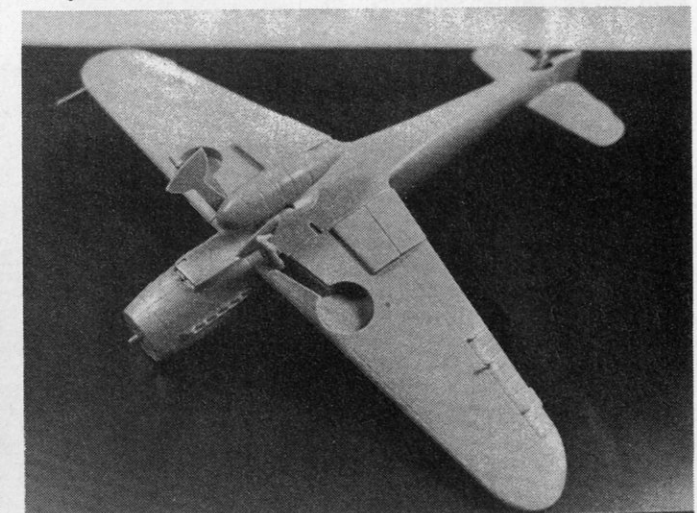
### Stage 4

Steps seven to 11 are concerned with the assembly of the wings and undercarriage and provide the modeller with optional parts for the model to be completed with the undercarriage up or down.



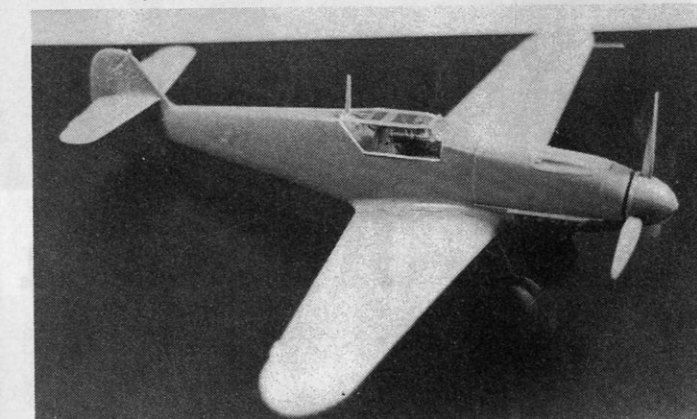
### Stage 5

The final assembly, steps 12, 13 and 14, present no insurmountable problems but one should exercise a great deal of caution at this point when adding the wings and tailplane to the fuselage. Careful attention to the correct alignment of the flying surfaces at this juncture can make the difference between an excellent model and an average one. Nothing looks worse than a model that has been completed with its wings out of rig. Add the optional centreline auxiliary fuel tank if desired.



### Stage 6

Now is the time to complete the painting and when dry, the decalling. Two alternate schemes are included on the decal sheet and are dictated by whether you built your model with or without the tropical air filter. I chose the JG 54 scheme as that Luftwaffe squadrons' colourful markings have always been of special interest to me. Unfortunately, the required swastikas are not included in deference to current German law, so one has to find them on the speciality decal sheets that are generally available at your better hobby shops.



### Conclusions

I found that this kit was very simple to build and offers both the newer and the more experienced modeller lots of potential. It can be assembled and included in an experts collection as it has great potential for a super-detailer or it is equally appropriate for a beginner as it is not at all complicated. When finished and painted, it holds its own when placed beside some of the latest mid-tech kits. Aside from that, it is the only kit of the Bf 109F in 1:48th scale now available.





# KITOGRAPHY



## THE Bf 109 in 1:48th SCALE

HISTORY books may never adequately reveal the answers to questions posed by those who seek to assess the relative merits of the various combat aircraft utilised by the combatants involved in World War 2. As a guest in this country, I have been personally aware of hearing and reading accounts of the 'finest fighter of the war' being portrayed somewhat chauvinistically in the shape of the undeniably aesthetic Spitfire. I have been very careful not to react to this claim when I suspect that as a foreigner I may be the subject of some good natured baiting.

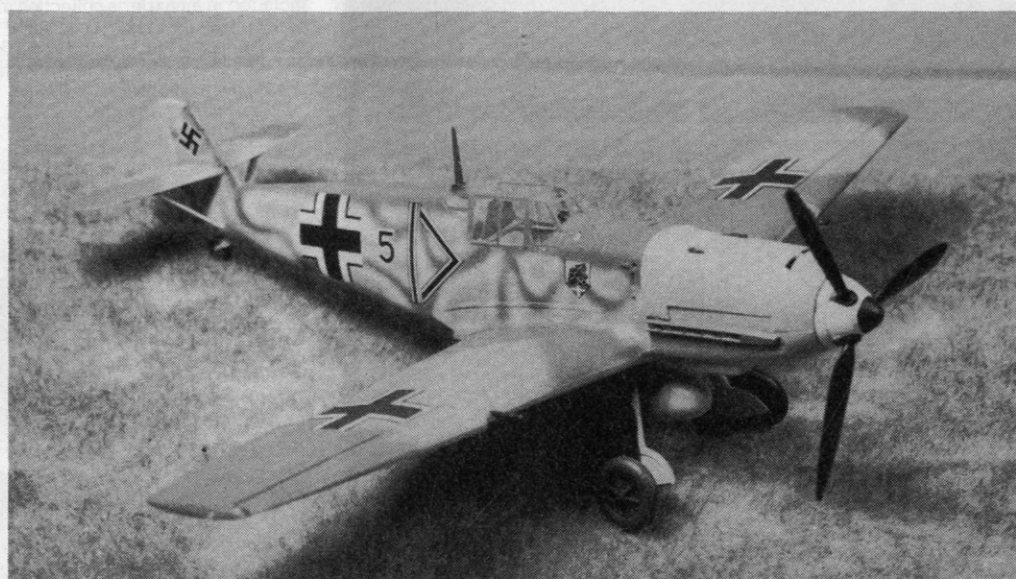
If one were to ask practically anyone with an interest in aircraft of that era which German type could be described as 'the best fighter', I would place my money on the answer to be the Bf 109. The term 'best' is a

difficult one as it implies a relative judgement and I tend to avoid it. If 'best' means that one that was most produced, then the Bf 109 certainly has earned that title as no other German fighter was built in

greater quantities. In fact, it was built in greater quantities than any combat aircraft before or since.

When it was conceived before the war, it was quite revolutionary as the powers

behind the Luftwaffe and the pilots themselves were biased toward the more traditional fixed undercarriage, open cockpit, biplane fighter. Reason ultimately won the day and the Bf 109 achieved its



Above: A restored Bf 109E. Right: Hasegawa's Bf 109E-7.



fame and shall always represent everyone's image of the classic German World War 2 fighter.

### DEVELOPMENT

As with most aircraft designs, the Bf 109 went through a series of design changes and developments that resulted in a wide variety of versions that altered its overall appearance through the war years. The very first Bf 109 was a vastly different aircraft than the last versions that were being produced at the close of the war. Even as the revolutionary twin jet Me 262 was being introduced into service, the last variants of the Bf 109 were still rolling off the production lines.

After the war was over, the Bf 109 continued to be produced by Spain and Czechoslovakia. The story of the development of this significant aircraft cannot be better told than by the display of a small collection of model aircraft placed wing tip to wing tip. Such a graphic display dramatically and concisely demonstrates the value of the use of a mere hobby for recording history. If a picture is worth a thousand words, then a model is worth ten thousand.

### THE KITS

Up until fairly recently, while the Bf 109 was available in a reasonable number of different versions, there were some obvious gaps in the series in 1:48th scale; 1988 produced the

The Hasegawa kit represented as a Bf 109E-3.

models that filled these gaps and provided the impetus that prompted me to build them and write this article. The kits come from a variety of countries and are presented in varying quality, but I can happily state that all are within the skills of an average modeller. I shall list them from the earliest version to the last.

**Bf 109B/C, Ventura Models.** This kit is one of the recent issues that fills one of the gaps in the line-up. It is of the 'limited

run' variety and therefore requires a little extra skill and effort to complete, but well within the average modeller's abilities.

The essential difference between the 'B' and 'C' variants was the exhaust pipes. The 'B' version had the exhausts flush with the fuselage, while the 'C' had the stubs extended. The kit is moulded with the stub extensions, so if you desire to make the 'B' version you must rub these down. This is the easiest

Ventura's Bf 109C shows its teeth.

conversion you are ever likely to perform.

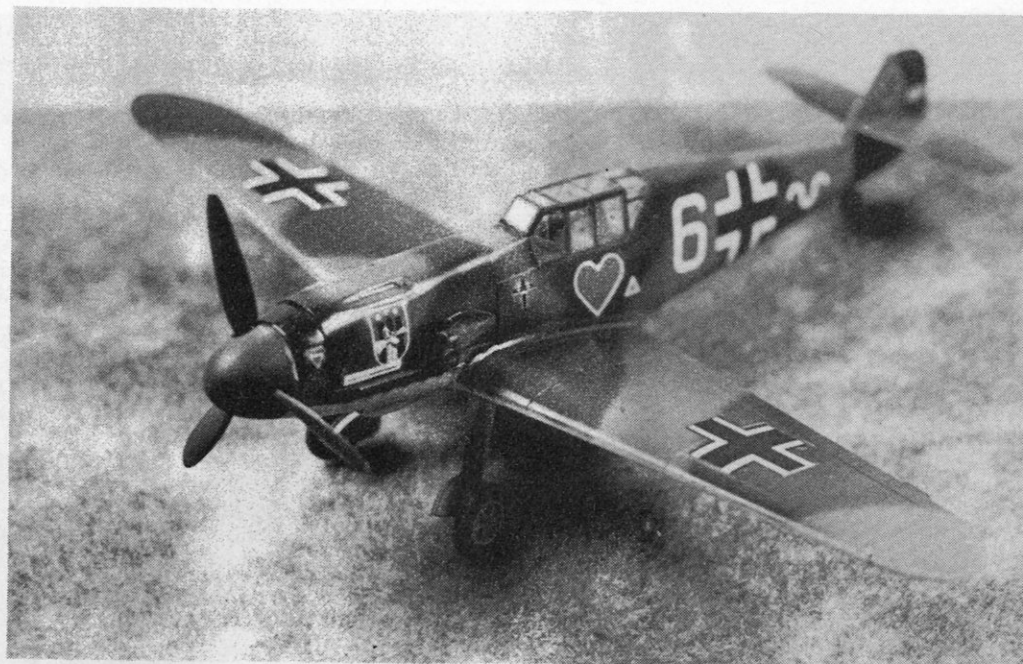
The most difficult part of this kit is the removal of the parts from the 'trees' and this is recommended using a razor saw to avoid destroying the parts as the plastic is somewhat brittle. All the parts then have to be rubbed down and finished to remove the excess plastic from them. Once this is done, the only other trial is the assembly of the cockpit area which requires some scratch-building as the kit does not contain the cockpit bulkheads. Some adventurous sanding and fitting is then necessary as the plastic cockpit parts included are not at all well moulded.

The canopy is vacuformed and two are included in case that you ruin one. The decal sheet is well printed and is for a really colourful sharkmouthed 'C' version.

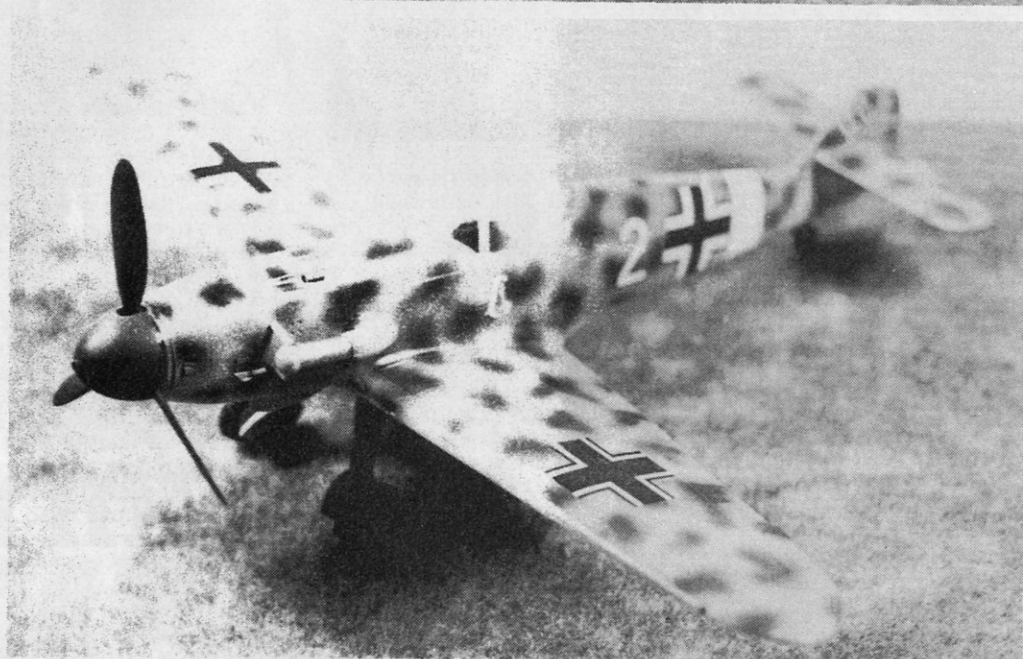
**Bf 109E, Hasegawa.** This kit is the 'state of the art' in plastic kits at the moment and is available in several 'E' sub-variants. I have built the E-3 version, as it had the earliest type of canopy, for contrast. The kit practically falls together and its detailing and finish are simply superb. Not yet available in the UK, I suspect because of their high price, are some white metal supplemental parts made by Hasegawa. They are, of course, on the market in Japan and if you are fortunate enough to have a Japanese pen friend, you could attempt a swap.







Left: The Airfix Bf 109F in 1:48 scale. Below: The Fujimi Bf 109G-2.



versions, this is not true. It does however, include more alternate parts than any of the other kits, with a wide variety of armament.

The parts contained do include the option of completing versions from the earliest 'G' models to the later, but not the last model. Two varieties of fin and rudder are also provided, the standard metal type and the later taller wooden type.

This kit goes together very well and the fit and finish is excellent. The decal, mentioned earlier, is worth the price of admission and includes markings for lots more Bf 109s than anyone would build in a lifetime. This is a highly recommended kit.

**Bf 109G (later versions), Arii.** This kit is one from the, now no longer in existence, Otaki firm. It came from an absolutely brilliant series of 1:48th scale World War 2 fighters, the moulds for which now are in Arii's hands.

The above Fujimi kit may also be built as a later model 'G' version, but I used the Arii kit as it only offers one version. This is a very good kit that is easy to build with a fine fit and finish. In actuality, none of these kits required any laborious filling and rubbing down. The only whinge about this kit is the decal which isn't really up to the standard of the kit itself. This is not a problem as the appropriate markings were obtained from the large Fujimi sheet. Aside from that minor complaint, this also is a highly recommended kit.

**Bf 109G-10, Revell.** Sadly this sleeper of a kit is no longer in

Alternatively, Verlinden Productions have an outstanding resin and photo-etched brass 'super-detailing' accessory kit that is now in the UK hobby shops. It won't be long before one of these turns up at the local or national model competitions. I had hoped to complete my kit with this item included but there was no time to do so.

**Bf 109F, Airfix.** This lovely kit is featured elsewhere in this issue and is a necessary addition to the series.

**Bf 109G (early versions), Fujimi.** The Fujimi kit is an older one that has been recently re-boxed with brilliant new box art and an absolutely smashing large decal sheet added. While the box title claims that the kit contains parts for the 'G' through to 'K'

The Arii (formerly Otaki) Bf 109G-6.



the Revell catalogue as it is very unique. It is the only 1:48th scale Bf 109 kit that represents the last series of Messerschmitt fighters which had the unusual streamlined nose-gun fairings that altered the appearance of these ultimate wartime 109s. I altered my model to represent a Bf 109K as that ultimate version completed my history of this famous German fighter in miniature.

The kit itself was made in West Germany by Revell GmbH and simply had to be a labour of love for whoever created it. While a simple kit with a minimum of parts, it captures the essence of this variant perfectly. It has a good fit and finish and due to its simplified construction is ideal for the beginner. The decal sheet in my kit, which was from a dusty corner in my loft and obtained years ago in the USA, was very good and even contained swastikas.

It really is unfortunate that this classic kit is no longer generally available, but I did see them on sale recently in my local newsagents. These were no doubt leftovers from some warehouse as they were at bargain prices. Keep your eyes peeled and you may be lucky enough to turn one up.

#### SUMMARY

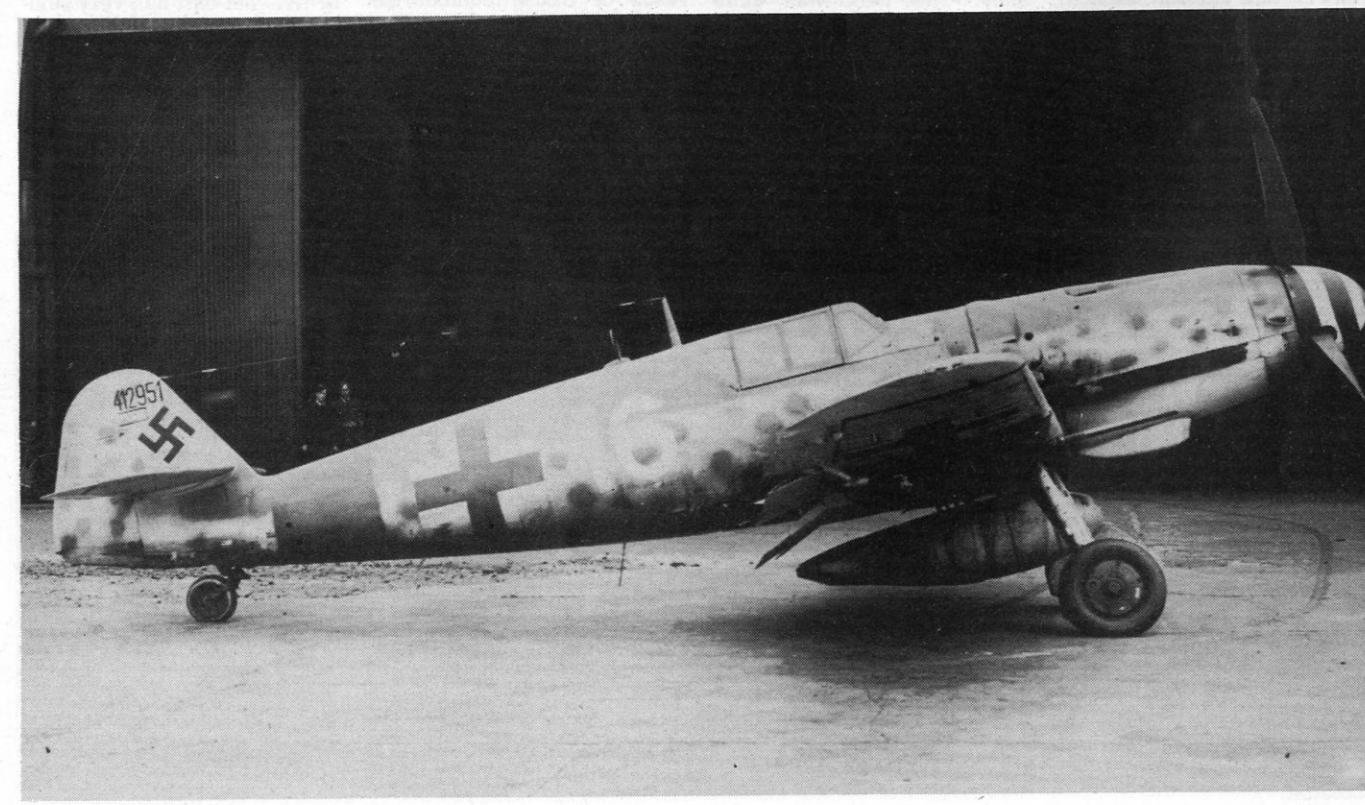
The above review is not the end of the story as there are

Right: Revell's remarkable no longer available Bf 109G-10 kit. Below: A contemporary photo of a late model Bf 109G.

other 1:48th Bf 109 kits available. I was going to include the Ventura Bf 109G-14 but I am at a loss to understand just why that kit exists at all. The G-14 model did not differ substantially from slightly earlier versions and even the most amateur craftsman could modify a Fujimi kit into that type and at a considerable saving in purchase price. There are a variety of 1:48th scale vacuum kits of other Bf 109 versions, including the Falcon Bf 109G-12 two-seat trainer and the Karo-As early models but these are not within the scope of this article. Airmodel of Germany also offer some cast resin kits, most notably of the Bf 109 prototype that would appeal to the most dedicated and well heeled Messerschmitt fan.



Verlinden's super-detailing kit for Bf 109E kits.





## ACCENT ON ARMOUR



# THE M4 SHERMAN

THE M-3 Lee entered service in the summer of 1941 and though it was a powerful machine, it was criticised for being too tall with its primary weapon badly situated. Its hull mounted 75 mm M-2 gun also had a limited traverse and could not be used in the 'hull down' position. As the first tanks were rolling off the production line, a mock-up of an M-3 with cut-down hull and turret mounted 75 mm gun was already being built. This new tank was known as the T-6, with prototype vehicles being built at Aberdeen Proving Ground and the Rock Island Arsenal. The T-6 had a cast 'turtleback' hull with large side access doors and a large cast turret which was, at the time, one of the biggest ever fitted to an armoured vehicle.

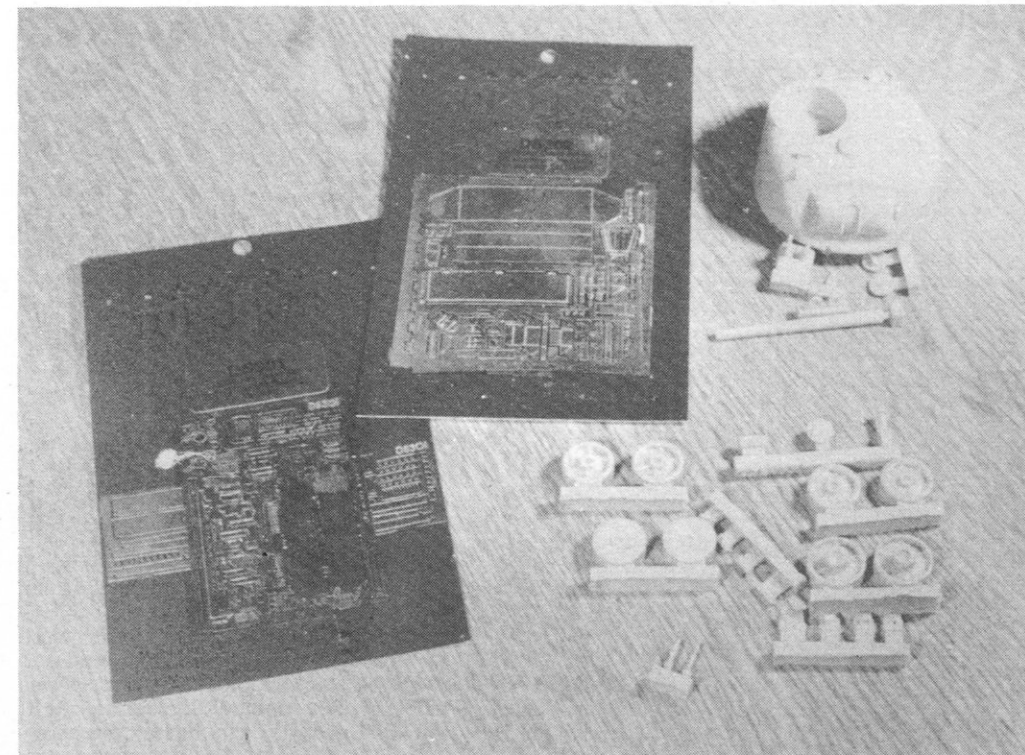
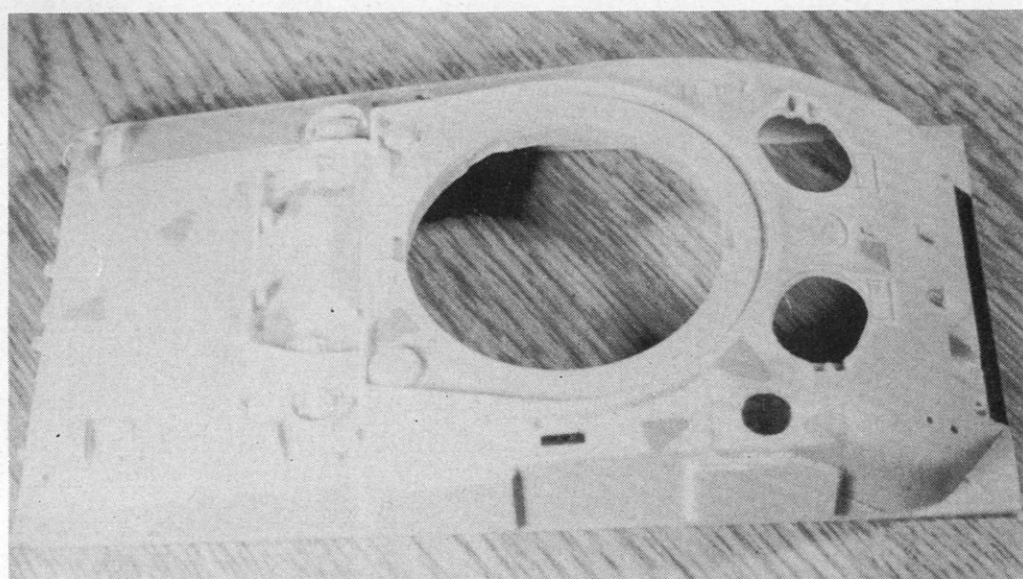
By September 1941, the new tank was on service trials and was clearly much superior to the M-3 Lee in terms of protection and offensive capability. The Verlinden M-4 Composite hull showing the detail changes needed to bring it up to scratch.

The tank was automatically much the same as the M-3, with the Wright R975 EC2 radial aircraft engine and transmission. The British became interested in the new tank at a very early stage, in fact much of the design work had been formulated as a

result of British combat experience in North Africa. The British Tank Mission financed the first assembly line at Lima Locomotive Works, the production tank being designated the M-4 Sherman.

The first of the M-4 series to enter production was the

M-4A1 with cast hull very similar to the original T-6 prototype. Although the first tanks were bought and paid for by the British, all M-4A1 tanks were diverted to the US Army, now that America found herself at war. America now had to produce enough tanks for her own



Sherman accessories by Verlinden and Top Brass.

bustle. All the new M-4A1s were built with the T-23 turret and 76 mm gun with the designation given as the M-4A1 76(w), this denoting the armament and wet ammunition stowage. The final production models had HVSS suspension and new wide track. The late production Turret mounted the M-1A1 gun with muzzle break and had a smaller loaders hatch. In all, 6,281 M-4A1s were built and a further 3,426 of the M-4A1 76(w) model.

The M-4 was automotively identical to the M-4A1 but featured a hull of rolled steel plate with welded joints. The early production tanks had the definitive M-4 type suspension, vision slots on the drivers hoods and three-piece differential housing. Other manufacturers brought into the programme were Baldwin Locomotive, American Locomotive, Pullman Standard Car and the Detroit Tank Arsenal (the latter building the M-4 Composite Hull version).

Changes in the details such as drivers hoods and cast differential housing followed the same timetable as the other tanks in the series. The 47 degree front plate was introduced to the M-4 at the Detroit Tank Arsenal in August 1943 and this modification was a cast front hull welded to the rolled steel plates. This version, built only at Detroit, was known in US service as the M-4 Composite Hull, the British naming it the Sherman Hybrid Mk.1. All M-4s built after January 1944 mounted the 105 mm Howitzer in a modified late production 75 mm type turret. Three M-4s had dry ammunition stowage, but they had all other 'late' features and so were designated M-4 105(w) to avoid con-

armed forces, as well as for the British and Soviet armies. The production of suitable tank engines was the major headache and several powerplants were eventually chosen for production, all being in the 400 bhp class. Different engines meant that the hulls often needed to be modified, usually at the engine deck and rear plates. In all five models of Sherman were built: M-4, M-4A1, M-4A2, M-4A3 and M-4A4, with several other prototype models which did not reach service status.

Though all models were used by the US Army, the only ones chosen for combat were the M-4, M-4A1 and M-4A3, while almost all M-4A2 and M-4A4 models were supplied to Britain and Russia. The reason for this was engine standardisation with the US Army considering the Continental R975 used in the M-4 and M-4A1 and the Ford GAA installed in the M-4A3, the most reliable of the bunch.

### PRODUCTION

Production of the M-4A1 started in February 1942 at Lima Locomotive and was followed by the Pressed Steel Car Company at the end of March. The first tanks had welded patches over the hull side doors, M-3 type suspension and hooded gunners sight. They also had two fixed Browning .30 calibre machine guns mounted in the front hull alongside the ball mounted hull gun position. A three-piece bolted An early production M-4A1 using the K&K Castings hull as described in the text.

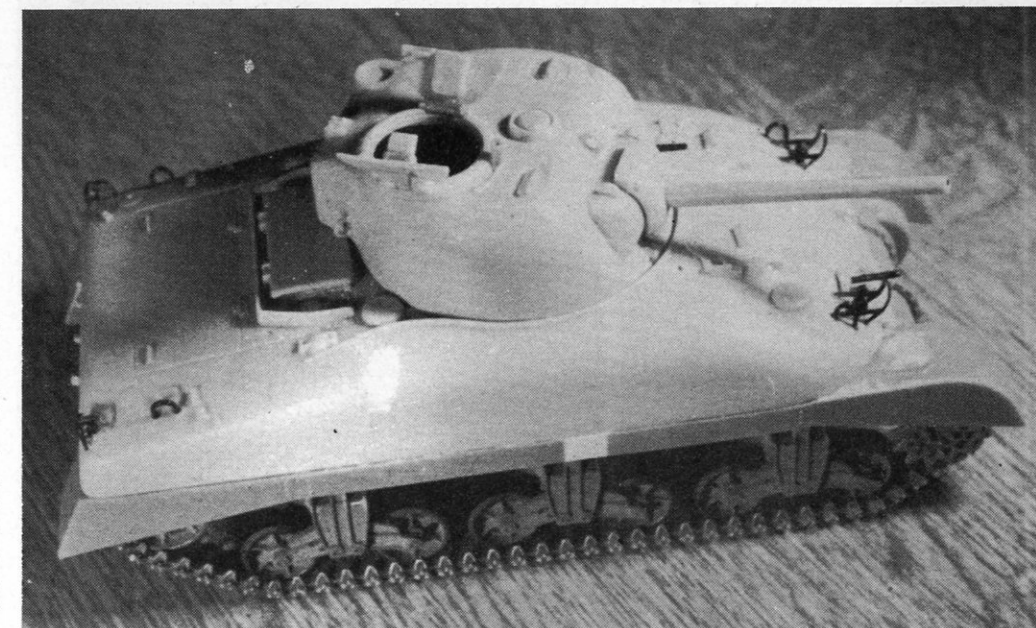
differential cover was fitted to the front hull and the drivers hoods had direct vision ports at the front. The hooded gunners sight on the turret roof was the first to go, which made casting the turret much easier, only the first 100 or so tanks had this hood.

Over the next month or two, the fixed guns were also deleted. Only the first few tanks had the patches over the hull side doors as new castings with smooth sides were used on all service vehicles. Pacific Car & Foundry began producing M-4A1s in May 1942 which had the above mentioned improvements right from the start in addition to the definitive M-4 type suspension, which was later adopted by all models. By the end of 1942 M-4A1s had the

cast differential cover and a periscope replacing the vision slits at the front of the drivers hoods. The 47 degree front with large hatches was introduced at the Pressed Steel Car Company in September 1943 and only a few of these tanks were produced, having been supplied to the British.

### PROGRAMME REVISION

In January 1944 the whole M-4 programme was revised with updated features including 'wet' ammunition stowage, 47 degree front hull and uprated engines. The T-23 turret was installed on variants armed with the 76 mm M-1 gun with the original 75/105 mm turret being redesigned with loaders hatch and modified turret





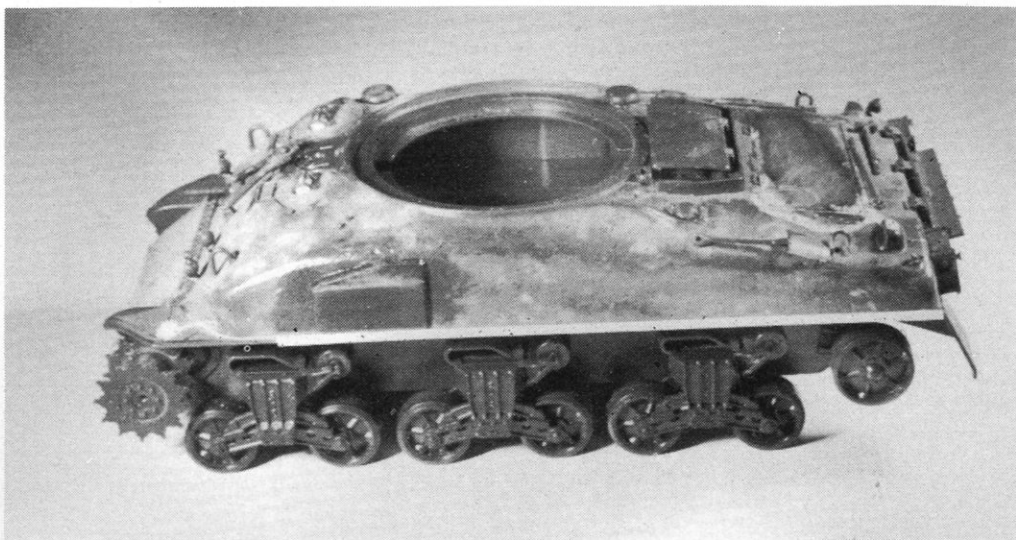
This is an M-4A2 mid-production model using the Verlinden hull.

fusion with the earlier models. Production figures for the M-4 were 6,748, with a further 1,641 of the M-4 105(w) model.

#### LAST VARIANT

The M-4A3 was the last of the M-4 series to attain production due to delays with the Ford GAA V-8 petrol engine. However, after introduction, this engine was the most powerful of all the M-4 powerplants and this gave the M-4A3 the best performance of all the petrol engined models. The M-4A3 was built first at Ford Motors and the total production of the early model was only 1,690. The M-4A3 was the most favoured of the M-4 series and in January 1944 it became the main production version, being built at Detroit Tank Arsenal as well as The Fisher Tank Arsenal. Four variants of the M-4A3 were built: 4,542 M-4A3 76(w), 3,071 M-4A3 75(w), 3,049 M-4A1 105(w) and 254 M-4A3E2 'Jumbo' assault tanks. The M-4A3 76(w) and M-4A3 105(w) were similar to the M-4A1 76 (w) and M-4 105(w), but the M-4A3 75(w) was the only 75 mm armed tank with wet ammunition stowage. Very few M-4A3s were found in foreign service, almost the total production going to the US Army.

Most of the diesel engined M-4A2 and the 'multi-tank' engined M-4A4s went straight to the docks for export to Britain or the Soviet Union, however, a few vehicles were retained in the United States for testing and experimentation. Some M-4A2s were supplied to the US Marine Corps for opera-



tions in the Pacific, these being early production tanks built during early 1943 which featured welded drivers hoods. Both the M-4A2 and M-4A4 were rejected for US Army service because of the complex engines. The M-4A2 was powered by two General Motors diesel engines coupled together, while the M-4A4 was powered by no less than five coupled truck engines, a total of 30 cylinders. Though it must be said that in British service both engines were considered very reliable, the only problem being maintenance on the M-4A4s multi-bank unit.

#### SERVICE HISTORY

The US Army received its first M-4A1s in the spring of 1942, with the first few hundred going to the newly formed armoured warfare training schools. Though America entered the war in December 1941, there were so few trained

men and so little equipment, that it was to be another year before the US Army could take part in any offensive operations. The British first used the M-4 series in action, followed by the US Army, who used the type during the Torch landings in North Africa. The US 2nd Armoured Division were equipped with the M-4A1 when landed at Casablanca on 8 November 1942. At Oran, the US 1st Armoured Division were landed and this unit was equipped with the M-3 'Lee', but as tanks were lost in action, they were replaced by M-4s and M-4A1s. Both of these divisions were to sustain heavy losses, first at Tebourba at the hands of the LXXXX Panzer Corps and at the Faïd Pass, where 84 American tanks were destroyed. General von Arnim's 5th Panzer Army all but wiped out the US 1st Armoured Division at the Kasserine Pass, but they were finally repulsed by the British

6th Armoured Division at Thala, where the German offensive was blunted.

The American units were usually lavishly equipped and by this time the Sherman was the equal of the German Pz III and IV. The initial poor showing of the American forces was largely the result of inexperience and the underestimation of German capabilities.

In Sicily the American armoured units fought much more effectively, having digested the lessons so painfully learned in North Africa. At Gela the 753rd Tank Battalion was engaged in heavy fighting, destroying three Tiger Is at the cost of four of its Shermans. Some 15 Panzer IIIs and IVs were destroyed by the Shermans of the 3rd Battalion, 67th Armoured Regiment. After the initial landings the American forces disengaged on the orders of General Patton and raced ahead for the city of Palermo, leaving the British to fight the bulk of the Axis defenders.

#### PACIFIC THEATRE

By the end of 1943, the M-4 series were in service with both the Army and Marine tank battalions fighting in the Pacific theatre. The tanks were M-4A1s, M-4A2s and a few M-4s. These models were joined by the M-4A3 75(w) by mid-1944. All the tanks sent to this theatre were armed with the 75 mm gun, as there was no need for anything more powerful with the opposition. The M-4 enjoyed a marked superiority over all Japanese armour, though the Sherman could be penetrated by the 47 mm anti-tank gun. The most feared anti-tank attack was the 'sticky bomb' as the Sherman's ammunition stowage arrangements made it particularly vulner-

The Italeri M-4A1 with Tamiya road wheels.

able to this weapon. For this reason many tanks used in the theatre used stand-off material such as sandbags, cement and wooden beams along the front and sides to nullify the effect of those weapons.

The late-production Sherman's began to arrive in Europe during the spring of 1944, just in time for the invasion of Normandy. British and Commonwealth troops were landed with American forces in almost equal numbers. However, the British were better organised and equipped as many of the armoured units were veterans of the fighting in North Africa and Sicily. This meant that the British were chosen to take on the German Panzers, while the Americans prepared to break out of the much thinner defences to the west comprising mainly of Infantry and Panzer Grenadier units.

The fighting was tougher than expected, with German tanks being complemented by a whole host of self-propelled anti-tank guns. In defensive actions many of these vehicles were far more formidable opponents than the Tiger and Panther. However, the Germans were steadily pushed back into the 'Falaise Pocket', which was closed by American and Canadian units on 19 August. The best part of two German armies were trapped and destroyed, totalling 150,000 men, over 400 tanks and SPGs, 7,000 trucks and other motor vehicles including 1,000 pieces of artillery.

The Sherman came in for much criticism during these battles. It was found that the 76 mm gun mounted in the late-production models could not hole the Tiger or Panther using the standard M-62 APC round. Even the M-93 HVAP round used exclusively by the 76 mm armed Tank Destroyers could only penetrate the German 'heavies' at less than 500 yards and only then if the shot angle was right. Older 75 mm armed Shermans were at an even greater disadvantage in the anti-tank role, but they had the saving grace of being superb support weapons firing High Explosive ammunition.

#### BATTLE OF THE BULGE

After the Normandy campaign, the Allied armies pursued the Germans into the Low Countries. The British to the north and the Americans, now outnumbering the British, held the central and southern sectors of the front. Many of the American units were 'green' and led by officers with no

The M43A3 is a simple cross kit conversion.

combat experience. The Germans were not slow in exploiting this weakness. In the dark foggy woodland of the Ardennes, on the early morning of 16 December 1944, operation 'Herbstnebel' began. This offensive became better known as the 'Battle of the Bulge', with the Germans attacking with 1,420 tanks. They soon punched a 'bulge' 20 miles wide and 40 miles deep into the American lines. The Americans had reports of their soldiers being shot after surrendering to Peiper's Kampfgruppe. This incited the Americans to hold their ground and fight by every means they had at their disposal. Several notable tank actions were fought with the Germans losing 450 tanks at Bastogne, which was defended by the Americans with great tenacity. Unfortunately, American senior officers had lost control of the battle and General Bradley was barricaded in his headquarters refusing to budge, fearful of the Germans roaming around the lines in American uniform. Eventually General Montgomery was to take charge of the battle with General Patton taking command of the southern sector. The battle ended with the Germans having 100,000 casualties and the Americans losing 81,000 killed, wounded or captured. Of these, it is estimated that 800 American prisoners were murdered by the Germans during the battle. The Battle of the Bulge was Germany's final offensive, though the German troops continued their stubborn resistance until the wars end.

The late model Shermans

with wet ammunition stowage were safer than the earlier models, but against the German 'heavies' they were just as vulnerable and ineffective. The M-26 was better armoured than the Sherman, but its 90 mm gun was only a little better than the 76 mm using wartime ammunition. American tanks were very reliable and suffered from few mechanical breakdowns, unlike the early British Cruisers which suffered more losses through breakdown than German guns! The main advantage of the Sherman was that it was available in large numbers, as the old Russian saying goes 'the God of War likes big armies'.

#### MODELLING THE SHERMAN

Building an accurate model of a Sherman can be a daunting task in view of all the minor variations undertaken during its production. Shermans can be dated by the suspension, road wheels, turret shape, hull front, tracks and many other minor details which may not be apparent to the casual observer. The Sherman is one tank that has benefitted by the resin revolution with many hulls and turrets now available to convert the 1:35th scale Tamiya and Italeri kits. I have made a list of some of these conversions as a general guide to the less well read modeller who wants to produce an accurate model for any given period.

#### M-4A1 (EARLY PRODUCTION) 1942

Use the K&K Castings M-4A1 hull, which has all the early

features, mounted on the Tamiya M-3 Grant lower hull. The early type turret is available from Verlinden, kit No.334, which has correct bustle and M-34 mantlet.

#### M-4 (EARLY PRODUCTION) 1942

ADV make a nice M-4 hull which can be used with the Italeri M-4A1 76(w) kit, though I would use the three-piece nose and not the late type cast nose found in the kit. Verlinden's No.334 turret would be best.

#### M-4A2 (MID-PRODUCTION) 1943

Verlinden's M-4A2 hull, kit No.333, is ideal for this version which was used in small numbers by the US Marines in the Pacific. I would fit this hull to the Tamiya M-4A3 chassis which has the correct 'solid spoke' road wheels and track. Verlinden's No.337 turret is the correct one for this model.

#### M-4 COMPOSITE LATE-1943

Verlinden's M-4 Composite hull is accurate in outline, but needs many detail changes to be truly accurate. This model can be built using the Tamiya M-4A3 kit which has the correct wheels and track. The late-pattern 75 mm turret can be used from the Tamiya kit or for a slightly earlier model, the Verlinden No.337 turret can be substituted.

#### M-4A1 76(w) 1944

The Italeri kit is a good basis, however, it does have the wrong road wheels and track





as the 'spoke' type wheels were very rare after 1942. These items can be obtained from the Tamiya kit. A late pattern T-23 turret with M-1A1/A2 gun and small loaders hatch will soon be available from K & K Castings. It is also reported that Verlinden will be releasing some HVSS suspension units for the final production models.

#### M-4A3 76(w) 1944

The Tamiya M-4A3 76(w) kit is easily converted to the 76 mm armed model by using the Italeri T-23 turret or the new K & K Castings late pattern T-23 turret.

#### M-4 105(w) 1944

The Tamiya M-4A3 kit can be used, with the engine deck from the Italeri kit and the rear plate cut off and set at an almost vertical angle. Verlinden produce a conversion kit, No.209, which converts the Tamiya 75 mm turret to the 105 mm Howitzer turret. This kit can also be used to produce the M-4A3 105(w) model.

#### M-4 (MID-PRODUCTION) 1943

MAC (Miniature Armour Conversions) produce an M-4 hull of the type which came into service at the beginning of 1943, featuring the periscope at the front of the drivers hoods. This

can be used with either the Tamiya or Italeri kits as both types of road wheel are acceptable. The turret can be the M-34 mantlet type, Verlinden No.334, or the M-34A1 mantlet, Verlinden No.337.

#### M-4A1 (MID-PRODUCTION) 1941

This MAC hull has the direct vision slots replaced with periscopes in the front of the drivers hoods, which dates it as early 1943 production. Both the Tamiya and Italeri kits can be used to provide the running gear and M-34 or M-34A1 mantlets can be used. The 'round' type cast nose was common on M-4s and M-4A1s built at this time. This can be made by filling the Italeri or Tamiya nose with Milliput and filing it down to a round profile.

This list is by no means the full Sherman story, as I have deliberately left out British and Soviet versions which will be covered in the future. As this article is aimed at the less experienced modeller, I have chosen the best quality accessories, taking into account cost and availability. The more experienced amongst us may prefer to kit-bash, for instance the Tamiya late-75 mm turret can be converted to represent the earlier turrets. The dates given with each of the kit conversions is

the year the tank came into service. Some of what I have described as 'mid-production' features were introduced in the autumn of 1942, but it was 1943 when the tanks reached the battlefield. The late-production Shermans were first built in January 1944, but it was another six months before they reached the front lines in any numbers. You would not find late-production tanks fighting at Anzio in 1943, but many early-production tanks built in 1942 were still in service at the end of the war, usually re-worked with new road wheels and perhaps one-piece differential housings. Many older tanks were fitted with applique armour in the field, especially over the vision ports in the drivers hoods.

The Americans often used at least two different types of tank in the same Battalion, early M-4s and M-4A1s were mixed, while the M-4A3 was kept separate because of its different engine. Late in the war, the battalions would have had either M-4A1 76(w) and M-4 105(w), or have the M-4A3 76(w) and M-4A3 105(w), each having the 76 mm armed tank as its main equipment, with some 105 mm Howitzer tanks for close support. The ratio was usually 3:1. However, in the Pacific, tanks seem to have been segregated with units using just one type. Most tanks used in the Pacific were armed with the 75 mm gun and many of the M-4A3 75(w)s were sent there

for use by both the US Army and Marines.

#### MARKINGS

In the US Army, armour was used by Infantry Divisions, as well as the Armoured Divisions, each Infantry Division having its own Tank Battalion. The markings used are:

1  $\Delta$  13  $\Delta$  D2 = 1st Armoured Division, 13th Tank Battalion, 'D' Company, No.2.

100-1781  $\Delta$  C-12 = 100th Infantry Division, 781st Tank Battalion, 'C' Company, No.12.

These markings were normally carried on the front and rear of the tank, Division and Battalion numbers to the left and Company markings to the right, as shown in the examples. Armoured units are denoted by a small triangle and the 'I' which denotes Infantry was always preceded by a dash to avoid confusion with numbers. Each tank carried a serial number and this was always started with the No.30 which denoted 'tank'. In the early war years the number was displayed as follows. USA-W-301215, usually in 4 in white lettering. From 1943 this was changed to USA 3030342695, sometimes the 'USA' was painted out leaving only the number.

The kits and accessory items mentioned in this article can be obtained from most of the larger models shops or by mail order.

Phil Greenwood

The first Sherman to see action was the M-4A1, here built in 1:35th scale using the K&K Castings hull and turret.



## BACK TO BASICS



## MODELLING FIGURES

The required collection of tools for figure modelling.

MAKING and painting military figures is one of modellings oldest disciplines, with beautifully detailed model warriors often being found in ancient Egyptian tombs. Today figures are widely available 'off the shelf' in several scales and materials. Some of these materials are potentially dangerous, especially to young children, so I would first like to point out some of the dangers.

White metal has a very high lead content and as lead is highly poisonous if swallowed, children can be affected by very small amounts. I always use a large kit box top as a tray to catch all the bits when cutting and filing, emptying the contents into a dustbin as soon as the job is finished. Some modellers prefer to solder models together using low-temperature solder and iron. If exposed to the fumes for long periods, some people are prone to headaches and a possible sore throat. Be sure to accomplish your work in a ventilated area to avoid any unnecessary risk.

Resin is becoming increas-

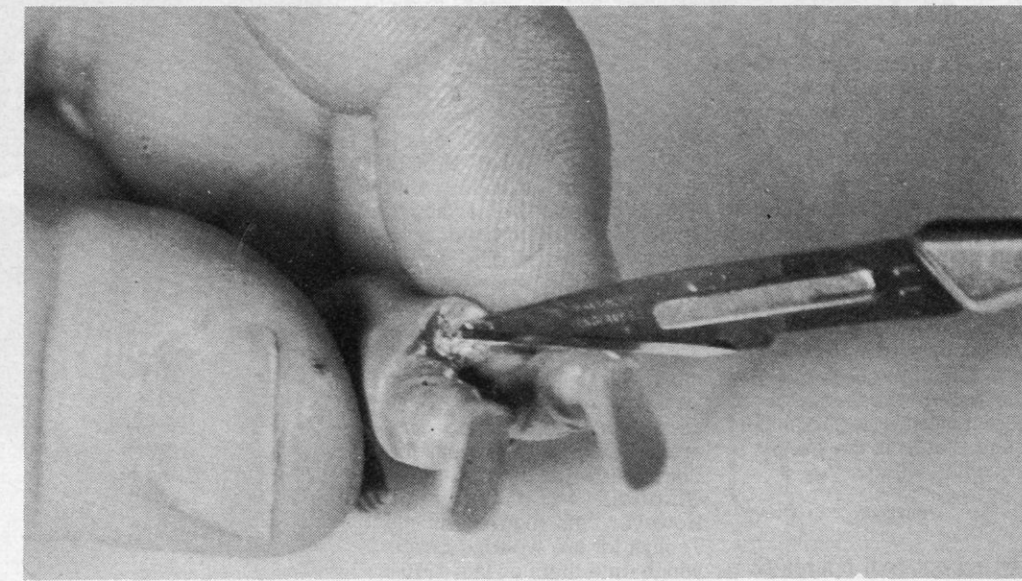
ingly popular as a modelling material and is relatively safe, but I would recommend a dust mask if drilling or sawing. Both resin and plastic give off highly toxic gasses when burned so be careful with these materials when using near a naked flame.

#### TOOLS

Your basic tool chest should

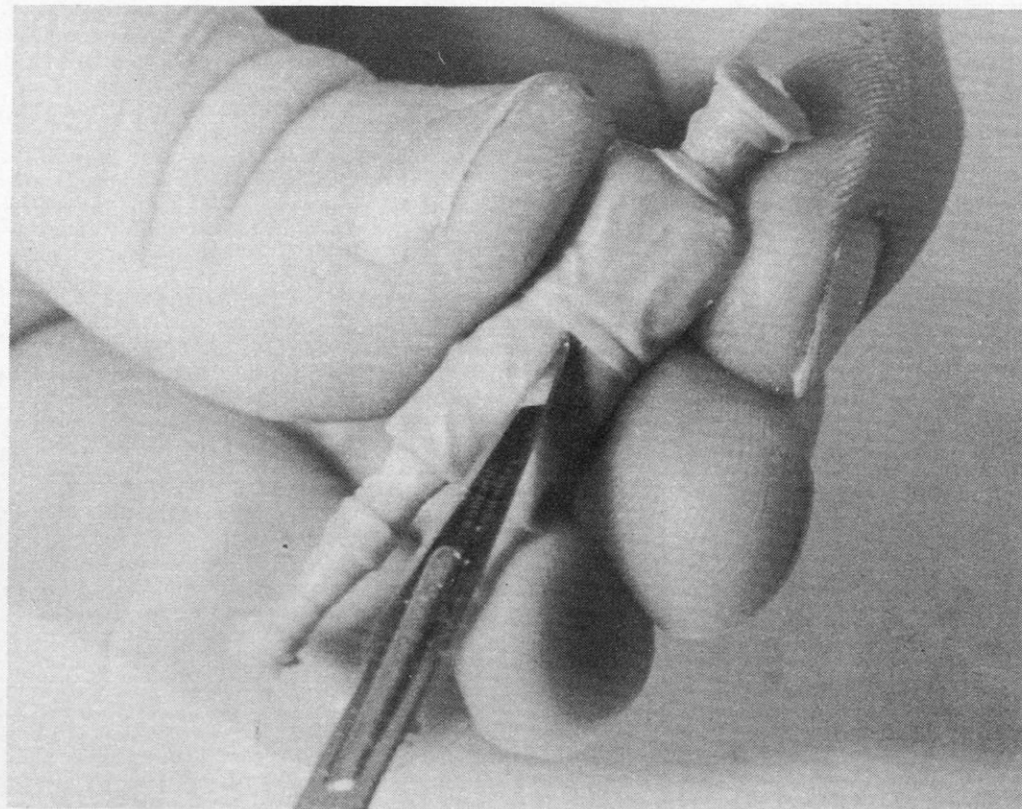
contain a razor saw, 'doofers', scalpel and a pin chuck with a selection of fine drills. The best razor saws are those by X-Acto which come in two grades, 54 teeth per inch (fine) and 42 teeth per inch (medium). Both are suitable for use on plastic, resin and white metal. The large blades can be cut down with sharp scissors to provide smaller and handier blades to fit the X-Acto Nos.1 and 2

handles. The 'doofer' is a modellers term for a dental probe or scraper. Good ones are made of high carbon stainless steel and are extremely tough. A pyro-gravure, a heated sculpting tool, is recommended for more advanced figure sculpting. Histor-ex sell one for about £18.50 and it is available from most model shops. However, a needle set in a wooden handle can be



Using a scalpel to undercut clothing.





Accentuating the detail with a hooked blade.

style of the pockets.

### CONSTRUCTION

With any figure, start out by carefully removing the parts from the sprue. If you pull the parts off, damage could result. The stalks are removed with a sharp knife blade followed by scraping off the mould lines which are found down the sides of the parts. Do not scrape too hard and destroy detail, the head in particular needs extra care. Weapons and equipment are likewise cleaned up ready for use. The figures can then be built up as per the instructions. I use superglue for an instant bond. Several techniques can now be employed to improve the figure, hopefully giving it a more realistic appearance.

The first job is to fill the joints and this must be done in a way that does not destroy the detail. Filler putty should be used only in small amounts so I would recommend one of the tube fillers such as Revell's Plasto, Squadron 'Green Stuff', or Humbrol Filler Putty. These fillers reset and fuse with the plastic, so it will not drop off as you are working it, as sometimes happens with epoxy type fillers. However, you must never use tube fillers in large amounts as they will destroy the plastic. Beware, as while the outer skin hardens, the interior often remains soft, sometimes for several weeks. Putty can also be used to add pockets, lengthen coats, turn

used with a candle flame as heat source. A 'night light' is the safest type of candle as it is difficult to knock over. Also very useful is the 'mini-drill', preferably with a variable speed transformer.

### SCALE

Figures come in all shapes and sizes, the most popular being 1:76th, 1:72nd, 1:35th, 1:32nd, 54 mm, 90 mm, 100 mm and 120 mm. Many of the small scale figures are made of polystyrene, which has a greasy surface and will not glue or bond with any current adhesive. But it is possible to exchange heads by mounting them on a pin and to bend limbs from one position to another. Large scale figures can be very specialised with a 100 mm mounted soldier costing up to £45.00. At these prices few modellers would want to chop and change these miniature works of art. Most of the larger scale figures are cast in white metal.

By far the most popular scales are 1:35th and to a lesser extent 1:32nd, with the 54 mm figures falling between the two. A 54 mm figure works out at 6 ft 3 in in 1:35th and 5 ft 8 in in 1:32nd scale, which makes them a touch too big for use with 1:35th scale military vehicles. In these scales all three materials are common, though plastic is the easiest to work with.

### THEME

I started out with figures as a

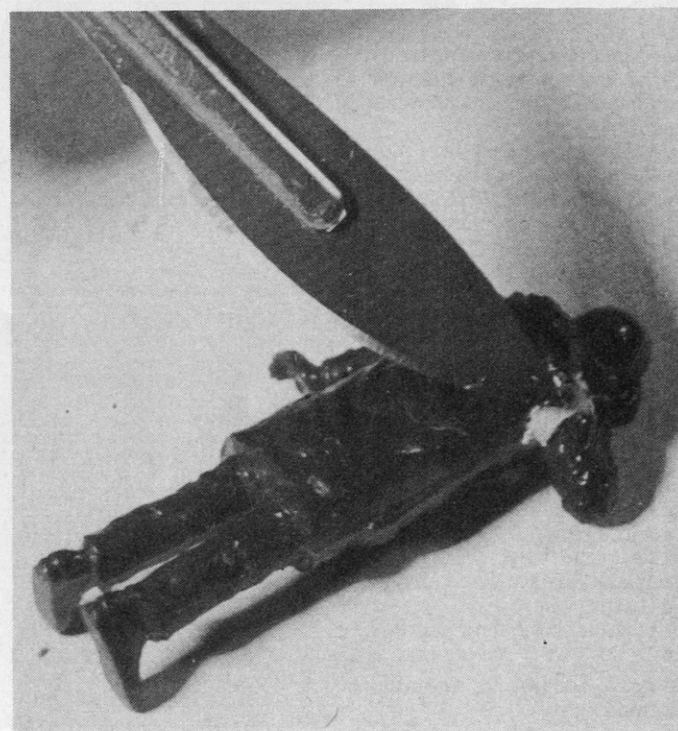
sideline to my collection of military vehicles in 1:35th scale. Most kits contain figures and my first conversions were to adapt some of these to provide my tanks with crewmen. The purchase of several Tamiya kits will bring you a small selection of figure parts with each containing one or two figures per kit. Most figures are built up from four pieces: arms, lower torso and upper torso with head and these can often be interchanged to give a greater variety. The selection can be expanded by interchanging heads and repositioning the arms and legs. Figure sets are also very useful and like the kit figures they often come in several pieces. Weapons and camp accessories are also available in 1:35th scale which in other scales these items must be scratch-built.

### THE POSE

The secret of good figure modelling is to pose the subject in a realistic situation with nothing looking worse than a figure with outstretched arms and open hands. The figure must be doing something recognisable by the observer such as drinking from a cup, carrying a gun or map, or perhaps merely holding binoculars. Armoured vehicle crews are a popular subject and some are useable straight from the box, such as the Tamiya Chieftain Mk.5 crewman. However, the figures in the Tamiya kit are wearing berets which date them as late 1970s,

so remember if you update the tank, you must also update the crew, since from the early 1980s tank crew have worn the hard helmet. The uniform is less of a problem as the cut has changed little from the 1950s. During World War 2 the military uniforms widely differed, but since that time uniforms seem to have become more standardised. Today most countries wear basically the same outfit, differing only in colours, insignia and minor details such as the number and

Applying filler with a knife blade.



shorts into trousers and to change the style of the uniform. Build up large areas in thin layers, giving each layer time to dry before adding the next one.

When the filler has had enough time to dry, the model is now ready to have the joints rubbed down, removing all the unwanted filler. As the areas where the filler is usually situated are quite small, the use of the usual 'wet and dry' is not recommended as it could destroy detail. Instead I used a fine scalpel blade to scrape away the filler, taking care to follow the contour lines. The blade does not have to be too sharp for this type of work, so I keep a few old blades aside especially for this task.

### OPTIONS

The next stage is one that is strictly optional, but it can, if done properly, greatly improve your figures. This is the removal of plastic, or other material, which makes the figure easier to cast. The best example of this is a long jacket or coat. Excess material is best removed with a mini drill fitted with a small round cutting burr

and then finished off with a scalpel. If you don't have a drill, then remove as much plastic as you can with a pin chuck with twist drills and finish off with the scalpel.

Uniform and equipment detail can be improved on many figures simply by undercutting with the tip of a scalpel or doofer. I use a No.3 handle fitted with a No.11 blade. Again this work is optional and I start out by undercutting hems at the bottom of the jacket and the pistol belt. Before adding such items as equipment and weapons, it is best to check some reference material to make sure they are correct for the period in which you want your model to be set. In this respect, some figure subjects have more scope than others. The German infantryman was lavishly equipped and though much of his equipment in 1939 was still in use in 1945, many new weapons had been added to their inventory. In contrast, the poor 'Tommy' had only his Lee-Enfield with the Sten gun not really in widespread use until the latter half of the war. These primitive tools were still being used in 1956 during the Suez crisis. In later wars, such as Vietnam, the scope is almost

endless, the NVA or VC soldier could be armed with the French MAS, Soviet AK-47 or SKS, as well as a whole range of captured American weapons.

### EQUIPMENT

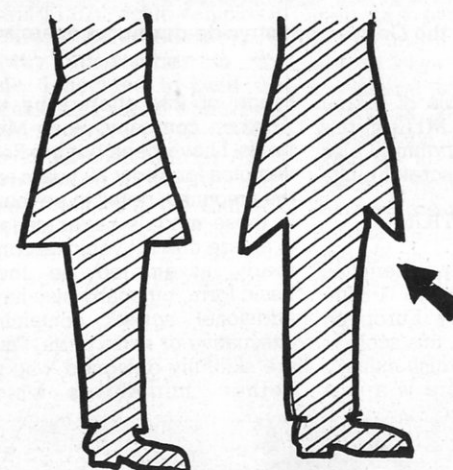
Equipment should be contoured to fit snugly onto the figure and not look as if it's been glued on. Sometimes the figure will also need a little trimming to ensure a good fit, but be careful not to remove too much plastic and spoil the figure. Webbing and straps can be added with 5 thou plastic card cut into thin strips. This thin, the plastic card must be treated with respect and must be glued in place with a smear of superglue, or use a fast evaporating liquid cement such as MEK from ED Models.

Finally comes the painting with either enamel or acrylic paints giving an equally good finish. Both types of paint have their advantages and disadvantages, which I will now outline. Enamel paints have been around the longest, but quality is sometimes questionable. In my opinion Humbrol is by far the best paint and is

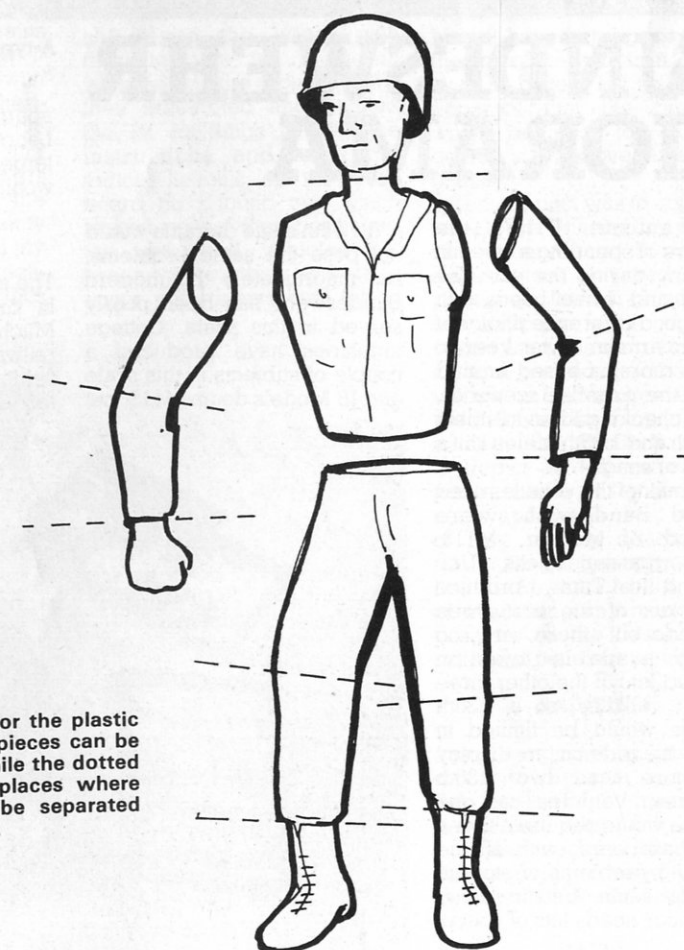
equally good for hand painting and airbrushing. Enamel matt colours are a true matt, unlike the acrylic equivalent which dries to an 'eggshell' or satin finish. Enamel paints such as Humbrol or DBI can be removed with Modelstrip paint remover paste, while acrylics are permanent once they have dried. Some acrylic paints chip or crack, sometimes after only a few months while this is not a problem with enamels. However, acrylic paint is less messy and can be mixed just as well as enamels. It can also be thinned for brush use by water, but alcohol is recommended to thin paint for airbrush use. Xtracolor enamels marketed by Hannants are incompatible with the Humbrol types and once dried, they cannot be removed with Modelstrip. Never use white spirit as a paint remover on plastic or resin.

This article explains only the basics of figure building. After you have tried the various techniques described no doubt you will want to add your own variations. The next step is to interchange parts and produce simple figure conversions.

Paul Woodman



Cross section of figure model showing the coat and how it can be improved.



The basic parts for the plastic kit figure. Most pieces can be interchanged, while the dotted lines show the places where the model can be separated and repositioned.



# BASES AND CASES



## BUNDESWEHR DIORAMA

LAST autumn, I had the pleasure of spending a week in Germany during the exercise season and came home with lots of good reference photos of German armour. I was keen to build a diorama based around one of the exercise scenarios, but on checking kit availability in 1:76th and 1:35th scales I hit a couple of snags.

The bulk of the vehicles used by the Bundeswehr were Leopard 2, Marder, M113, Transportpanzer Fuchs, Unimog and Iltis. Tamiya produce 1:35th kits of the first three vehicles, but there are no readily available injection moulded kits of the other three support vehicles, so a 1:35th diorama would be limited in scope. In addition, to display any more than two 1:35th armoured vehicles in one diorama would require either a large baseboard, with all the attending problems of storage space for same. A static scene, for armour needs lots of space.

The kind of extra parts included in Roco kits.

A 1:76th scale diorama would not pose the same problems, but unfortunately the modern Bundeswehr has been poorly served in this scale. Cottage industries have produced a couple of subjects in this scale and JB Models do an M113, but

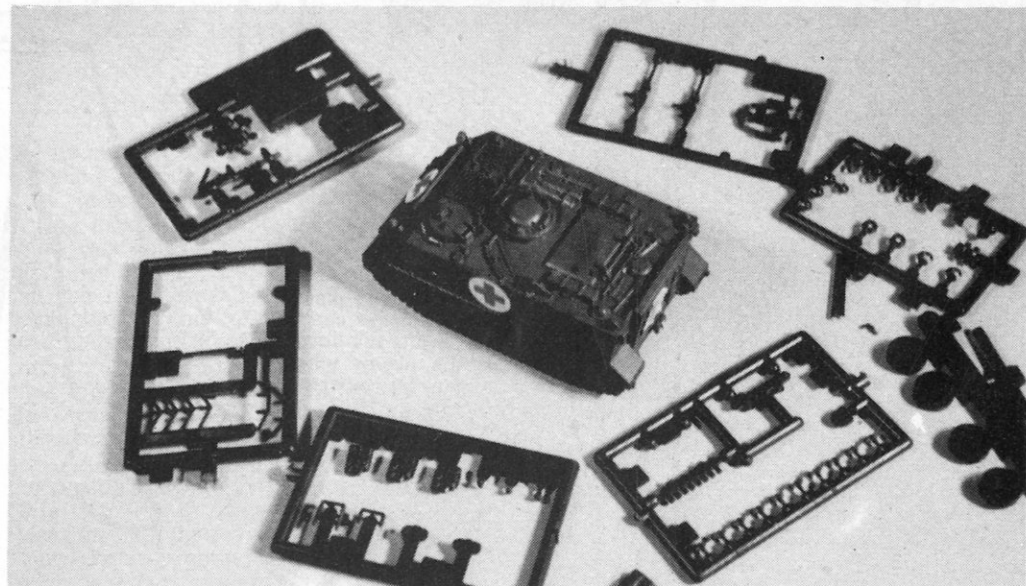
A typical scene in the German countryside during an exercise.

apart from a couple of 1:72nd Leopards and an M113 in this larger size, everything else would have to be scratchbuilt.

### THE SOLUTION

The answer to the problem lies in dropping scale to 1:87th. Much favoured by European railway modellers, this scale is seldom used by British military modellers, but there is a vast

range of kits offered by the Austrian company, Roco Mini-tanks. I have been buying Roco vehicles for about 20 years and the amount of detail to be found in these models never ceases to amaze me. All vehicles come ready assembled, in their basic form, but many also have additional sprues containing alternative or extra parts. They are skillfully designed 'clip together' miniatures which



A German M113 ambulance  
(Photo: Author)

require no cement, but experienced modellers will want to glue them together after stripping down to basic components for painting.

The tracked kits have solid tracks and easily removable secondary wheels (for the young) and the wheeled vehicles have steel axles to give free wheeling capabilities, but don't let this put you off. The range of over 200 World War 2 and modern AFVs and soft-skins is second to none for accuracy and choice. With a few exceptions, the range only covers vehicles which have been used in Germany over the last 50 years, but this covers all manner of tanks and trucks from Cromwell, Jeep and Kubelwagen to Abrams, Mutt and Iltis with such unusual subjects as Lance, Saladin and M114 also being covered. The range also includes such Soviet gems as the T72 and Scud-A missile launcher. To complement the range, Model Transport are producing an ever-growing range of resin British and Soviet soft-skins and APCs.

### ACCESSORIES

One of the greatest advantages of using 1:87th scale vehicles in a diorama is the wide range of railway accessories in this scale. I decided to base this diorama on a scene which I witnessed where a Panzer Grenadier Regiment's Marder APCs were moving forward through a small hamlet in the Einbeck Bowl, where a forward aid post had been set up. To re-create the scene, I required a

timbered thatched German farmhouse and a couple of farm buildings. A quick trip to the specialist railway modelling shop in the next town resulted in a couple of old Revell farm kits being procured at knock down prices in a sale and I also took the opportunity to stock up on some scatter materials for the groundwork. A couple of weeks before, I visited an open day at the local model railway club and picked their brains for groundwork techniques. It always pays to talk shop with modellers from other disciplines as all sorts of techniques can be borrowed and adapted to suit each others needs. On this occasion the learning process was certainly not one way as they picked my brains on weathering techniques and the use of acrylics



and a pleasant hour was spent at the clubhouse bar trading tips.

### THE BASE

Before starting, I set a size limit of 9 x 15 in (225 x 375 mm) on the diorama to ensure that it would fit my display case. I made the base from a piece of mahogany veneer chipboard with matching iron-on edging and taped the edges with masking tape for protection when adding the groundwork. I then assembled and painted the kit buildings as per the instructions and tried out various layouts on the base board till I found one which looked right. I then positioned the unpainted vehicles between the buildings and made minor adjustments until things

looked right from all angles. It was originally my intention to use three Marders (a Zug or Platoon) but it was evident that the diorama would be too cluttered and the vehicles would have to be placed almost bumper to bumper which would have looked wrong, so instead I used only two. I had built two farms and two outbuildings, which I thought I would need to fill the base board, but when I pencilled in the line of the road from the top right to bottom left, it became apparent that the buildings would be much too close together, so I removed one farmhouse.

The aid post was to consist of an M113, a Unimog and an Iltis, but once again the scene looked too cluttered, so I positioned the M113 between two buildings where it would attract less attention from the air and parked the Iltis utility vehicle on the farmhouse courtyard. It had been my intention to rig the Iltis with radio aerials to depict an HQ vehicle and add a couple of figures in the courtyard, but as usual I ran out of time on my deadline for taking the photographs. Once I had decided the final positions of everything and marked the positions on the baseboard, I set about painting the vehicles.

### PAINTING

I used acrylic paints throughout on this diorama including the groundwork, mainly because they are quick drying, but also because the Gunze Sanyo range offered all the colours I needed for the

A Marder at rest. (Photo: Author)





Note the painting of the thatched roof.

second Marder slightly out of line with the first to depict movement (if both Marders were to follow exactly the same line, the scene would look artificial and static). Remember when depicting vehicles in Germany to position them on the right side of the road, even on narrow roads such as this! I then filled the road 'trench' with Tetraon to the full depth of the tiles and smoothed it with a wet steel rule to give a dead flat surface.

When almost dry, I painted the road surface with thinned Tamiya black acrylic and quickly scattered the contents of a bag of tarmac railway scatter over the wet surface. An hour later when the paint was dry, I turned the base upside down over a sheet of newspaper and tapped the bottom to recover most of the scatter. Any bald areas were touched up with paint and a small amount of scatter. I chamfered off the edges of the ceiling tile around the edges of the base then applied a thin layer of Tetraon to all the areas not going to be covered by buildings or the courtyard. Some areas were built up slightly, particularly at the roadside, to break up the uniformity of the base. Each area was dealt with separately, to avoid the Tetraon setting before I had time to colour it. Once again I used thinned acrylics to colour the Tetraon, this time browns and greens and I added various shades and textures of railway scatter to depict grass and bare earth. I then added the courtyard, which was cobble effect plasti-

vehicles and both Humbrol and Tamiya paints can be thinned with Isopropyl Alcohol for groundwork washes. The buildings were primed after assembly with Hols white auto primer, which acted both as final coat for the walls and gave an ideal base for Humbrol and Tamiya acrylics. The thatched roofs were depicted by lots of washes of very thin paints over a sand base colour, the final washes being dark browns and red browns to give depth.

All decals were from the Roco sheets which give a full range of tac signs, national insignia, red crosses etc. I used Humbrol Decal Cote 1 and 2 to fix them and got good results. In the past I have relied on an American decal fixing solution, which works very well, but as I had almost run out of both solutions at the same time for once, I decided to try Humbrol's version this time and it worked a charm. The Roco number plate sheet is self-adhesive, not a decal and requires a keen eye to cut the plates from the backing, but the results are acceptable for all but competition models.

The groundwork is always the most time consuming part of diorama building and if not enough care is spent on it, the whole effect is ruined. I had already marked the position of all components on the base and taped the edges for protection, so I started off by laying the road. I covered the entire base board with polystyrene ceiling tile, transferred all the markings to the tile, stuck it down with PVA glue, then when dry cut out the road portion, back

An Itlis vehicle, though not of the ambulance variety. (Author)



Dioramas change character dramatically when viewed from different positions.

down to the wooden base. The road had a slight curve to make it look less artificial and I opened out the top right corner to depict the start of a junction. This allowed me to position the



Note the diminutive size of 1:87th scale vehicles.

card, painted grey and blended it into the road with paint and scatter. When positioned, I gave it several thin dirty washes and when dry dusted both the road and the courtyard with crushed artists pastels. When satisfied with the basic groundwork, I positioned the buildings and glued them in place with PVA.

#### WEATHERING

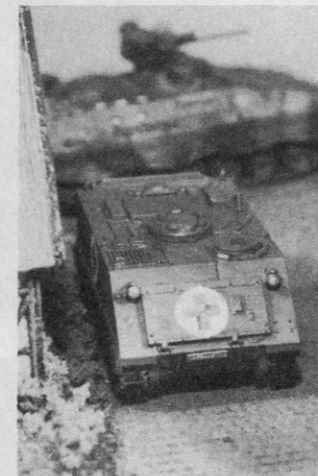
When I was in Germany, the first snows of winter were arriving, which tended to give everything a monochrome effect. To depict a winter scene properly is very difficult and seldom looks right in the smaller scales, so I moved the action back a few weeks to early autumn. At this time the vegetation would still be in leaf and the colours easy to depict. I started off by making hedge-rows along both sides of the road where appropriate, from natural moss. Whenever you're in the country keep an eye open for suitable moss and lichen for dioramas. Used carefully, a small plastic bag of moss can last for years; just add a few drops of water every time you remove some from the bag and keep it out of direct sunlight.

Use PVA glue for fixing moss and lichen as it dries clear. I had intended to use a couple of trees, but decided against this as the base was looking crowded enough, so instead I stuck some rubberised horse hair to a couple of areas to represent brambles and when dry coated the 'stalks' with water thinned PVA glue, then sprinkled on some Woodland Scenics leaf effect scatter. This is a foam-like scatter dyed to represent various colours of leaves and is used extensively

An almost eye level view demonstrates the realism of this diorama.

by railway modellers. It can also be used to good effect on 1:35th dioramas.

In addition to the brambles, I also dabbed thinned PVA over small areas of the base and along the edges of the buildings at ground level and added clumps of this foam scatter to depict plants and ivy. Small dabs of glue can be added to the walls and various scatters used to depict climbing plants, but don't overdo this as it can look artificial. As a final touch I teased up the scatter with a stiff paint brush and added some brown earth effect scatter to the paths outside the outhouse doors and the flower beds under the farmhouse windows and touched up the odd areas which had been damaged or looked thin. The whole diorama was then turned upside down to remove all loose scatter and then dusted with artist's pastels. The vehicles were dusted with pastels then glued to the base in their final



A close up of the M113.

locations with PVA.

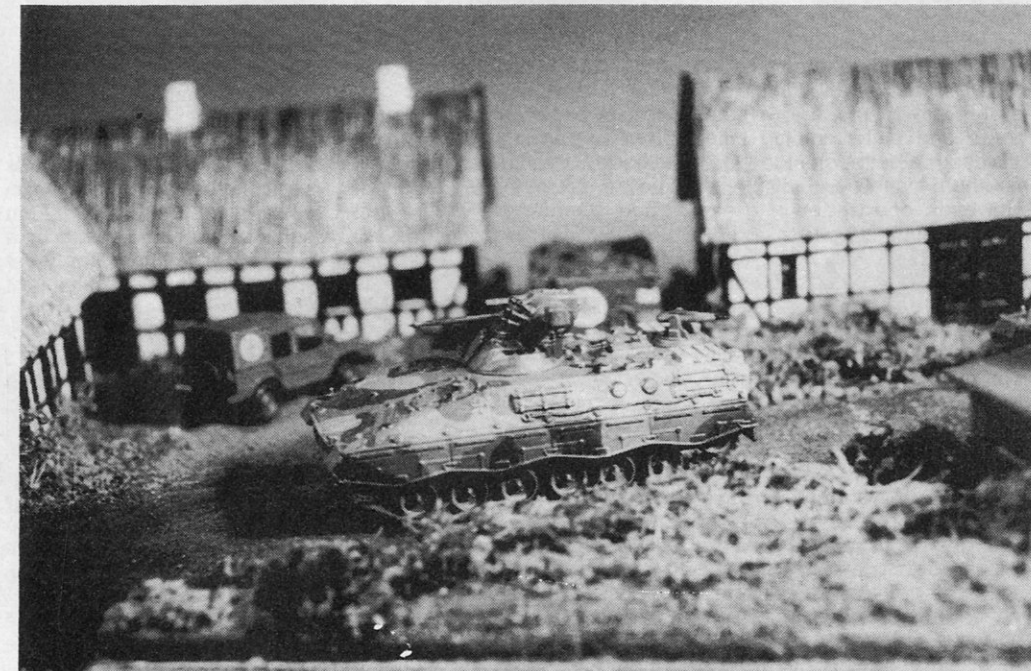
#### FIGURES

As I said earlier, I would have liked to have added a couple of figures to the diorama, but time

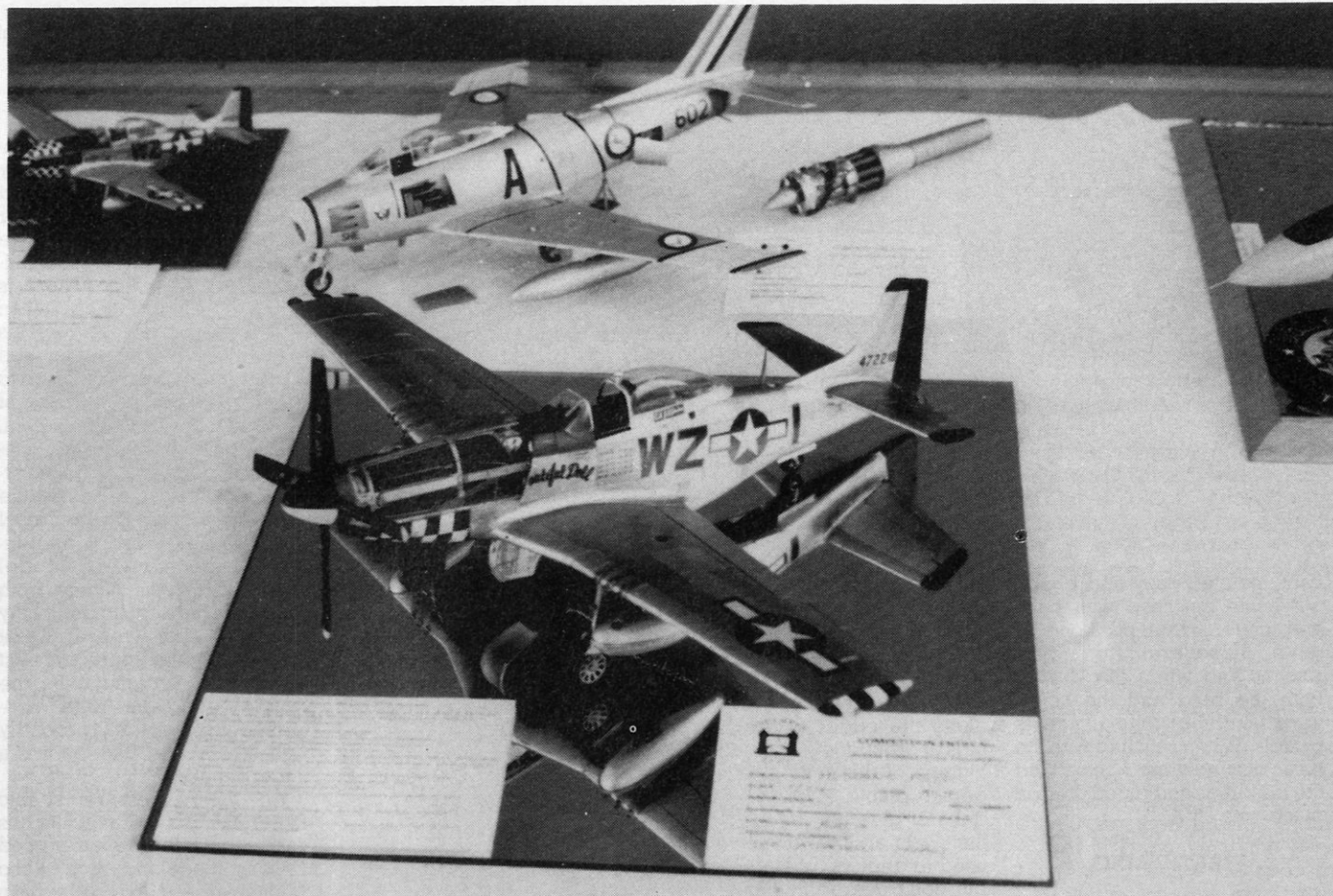
did not permit this. Roco produce a few sets of military figures in sitting, standing and walking poses as do Presier and civilian figures in this scale can be found in any good railway modelling shop. There is a large variety of civilian and public service vehicles available in this scale and Model Transport are soon to release the Scorpion family of V's in this scale cast in resin. The main reason for my visit to Germany during the exercise season was to test drive the latest military Turbo Diesel ninety Land-Rover. I had intended to convert Model Transport's resin Ninety from soft-top to hard-top to depict my vehicle and would have asked it in the courtyard next to the Itlis. Unfortunately, the article deadline date prevented this, but I'll probably add it at a later date as it is a superb model.

All the necessary scenic materials for a diorama like this can be obtained from any good railway modelling shop. Roco Minitrains are available from specialist shops or direct from the importers, Continental Model Supply Co, 36 Gray Gardens, Rainham, Essex RM13 7NH and Model Transport resins are available from the same source or direct from Model Transport, 18 Bevan Way, Aylesham, Canterbury, Kent CT3 3DN. If writing to either manufacturer or importers for details of their ranges, it helps to send a large stamped self-addressed envelope.

Bob Morrison







# EXPO SOUTH 1989

NOT a few years ago Chris Ellis in his book *How to go Plastic Modelling*, referred to the laws of domestic opposition. The organisers of Southern Expo have discovered another, that when the sun shines Mum does not want to go to model shows.

For the Association of London Modellers the Expo started earlier than usual, as with another of their innovations, they had booked the halls from the Friday noon to give the trade and clubs coming long distances a better chance to set up their stands and displays. However, one trader of great repute commented that in previous years they had set up and were trading in an hour-and-a-half, this year with time to spare they had already spent three hours setting up and were still not finished. It obviously did not do any harm, his shelves of Hawker Sea Furies were cleared the first day. If you bought one wait a bit before building it. Whisper has it there are some Hi-Tech goodies on the way. Whilst all this activity was under way Sue Arrow-smith of the Association dispensed largesse in the shape of food and drink to all the early arrivals, this being

greatly appreciated.

Very early in organisation of this year's Expo the ALM ran into problems because the Merton Council had double booked the halls, thus they were forced to accept the Easter weekend. This was reflected in the reduced number of visitors the second day in comparison with previous years. With a bright clear sunny day and the many outside attractions of Easter and despite expensive advertising, fewer paying customers attended on the Sunday. This did not prevent the majority of trade stands from doing well and the visitors from enjoying themselves.

## TRADE PARTICIPATION

As usual the trade took the opportunity to release many new items on to the market and there was something for just about everybody. The World War 1 aviation buffs had a field day with three new releases from Phoenix, a BE.2A, an Otto Doppeldecker and a first, a Mitsubishi 1MF1, Blue Rider released a Sopwith Camel (Comic) night fighter conversion kit with injection moulded, white metal and brass items

complete with the usual excellent decal sheets.

Akita displayed their new Sopwith Cuckoo and Pfalz while Aeroclub typically had many new items.

Esoteric had a superb twin-engined Douglas flying boat displayed as a future release.

## MODEL CARS

One display that is always worthy of comment is the car collection of Jim Whiffen. It grows not a little each year, with a over a thousand models on display and he is now working on a tribute to Jaguar. Jim builds model cars five at a time and this collection will only get better, with its own section of the hall, colourfully postured.

Attracting a great deal of interest was Phillip Charlton's paper models, with nodding dinosaurs that turned their heads as one passed, plus aviation and architectural models, whilst circling overhead was a Pterodactyl, being so close to the Esoteric stand comment was heard that it should have been holding an anchor. If I have forgotten anybody please forgive me, there was so much to see and so little time.

Class winner P-51D 'Big Beautiful Doll' by Terry Scott.

By Rod Holland

## MODEL CLUBS

The club displays were, if possible, to an even higher standard than usual. Among those of note, was the Cleveland Club's year long effort to produce models of first line aircraft of all the major participants of World War 2 in 1939. IPMS Kent took the Best Club display award for the history of Coastal Command, taking it away from the Newark Club for the first time in three years, which is just as well, as we had to buy a new trophy anyway. Eric Cross of the South London Model Club won the 1939 Theme award with his superb diorama of a Barrage Balloon. The award was an original water colour painting of a Fairey IIIF of 820 Squadron over Valetta Harbour by Richard Caruana one of the sponsors of the Show.

During the night of Saturday some 30 modellers took part in the Modelaid section, modelling through the night in aid of the children's charity, Child-line, and as soon as all the sponsorships have been collected it is anticipated that a healthy cheque can be presented to this worthy cause.

The organisers freely admit

that they made some minor errors and as in any enterprise, let alone organising a show of this size, it is unfortunate that their organisation slipped. The ALM Expo Committee apologise most sincerely to the unfortunate modellers who missed out and promise that they'll get it right next year!

Southern Expo 90 will take place at its usual venue of the Canons Leisure Centre, Mitcham, Surrey on 24-25 March 1990 and the theme of the show will be the 50th anniversary of the Battle of Britain.

## WINNERS

The prizewinners were:

**Best Club Stand:** IPMS Kent.  
**Best Trade Stand:** ED Models.  
**Most humorous model:** 'Don't be a Sitting Duck' (Les Cooper).  
**1939 Award:** 'The Balloon is about to go up' (Eric Cross).  
**SF/Fantasy Trophy:** 'Chaos Destroyer' (F. Gray).  
**Windscock — best painted World War 1 aircraft:** Fokker D.8 (Vic Cook).  
**Golden Age Trophy:** Tony Wollett's display.  
**Flying Past:** 'S Sugar comes home' (Keith Rogers).

**Historex Trophy:** 'Death of Major Peirsop' (K. Ives).

**Wingspan Trophy:** Mystery Racer (Alan Clark).

**Bi-Plane:** Argosy (Vic Cook).

**Rod Jane Trophy:** Fokker V.29 (Wolfgang Schultz).

**Best in Show — Senior:** Lotus 99T (Tony Bourke); **Junior:** 'Peace for Galilee' (Adam Bartlett).

**Best Cockpit:** Mystery Racer (Alan Clark).

**Matchbox Cup:** 1st Siskin IIIa, Vic Cook; 2nd Wessex Har 2, K. Sherwood; 3rd B-25J, Brenda Marsh.

**Strike Command:** 1st Jaguar GR.1, J. Bryce; 2nd Lightning F.1A, Ray Osbourne; 3rd Hunter F.6, Brenda Marsh.

**Fleet Air Arm:** 1st Wyvern, Brian Marsh; 2nd Canberra T.22, Brenda Marsh; 3rd Gazelle, Dave Burlison.

**8th Air Force:** 1st B-17F Flying Fortress, K. Sherwood; 2nd B-17G Flying Fortress, K. Sherwood; 3rd P-51B 'Bald Eagle', G. Illsely.

**Kev Rumble Memorial:** 1st Hell-diver, Brian Marsh; 2nd SH-60B Seahawk, D. Reeve.

**Battle of Britain:** 1st Spitfire IA, John Bryce; 2nd Blenheim IF, Brian Marsh; 3rd Battle, Brian Marsh.

**A1 AFV 1:50th scale and larger:** 1st DUKW, Eric Johansen; 2nd Tiger 'E', Angus Creighton; 3rd Sturm-morser, R.E. Pink.

**A2 AFV 1:51st scale and smaller:** 1st Whites 920 Tank Transporter and Valentine, R. Allibone; 2nd Merkava I, S. Gucczynski; 3rd Renault AMC Type AGC, Eric

Johansen.

**AC1 Aircraft 1:100th scale and smaller:** 1st Lancaster VII, Brenda Marsh; 2nd Fokker D.8, Vic Cook; 3rd McDonnell Douglas MD-81, M.P. Stuart; **Junior:** 1st Jaguar GR.1, James Bliss.

**AC2 Aircraft 1:99th to 1:64th scale:** 1st Sunderland, A. Dent; 2nd Cant Z506, Vic Cook; 3rd Douglas JD-1 Invader, Colin Spooner; **Junior:** 1st Bulldog Mk.IV, H. Bone; 2nd Junkers Ju 87, H. Bone.

**AC3 Aircraft 1:63rd to 1:48th scale:** 1st Avro Arrow Mk.I, Adrian Constable; 2nd P-51D, Keith Sherwood; 3rd Albatros D.1, H.J. Randall; **Junior:** 1st MiG-29 Fulcrum, Chris Oakley; 2nd Me 262, D. Chesterman; 3rd F-4 Phantom, Graham Wood.

**AC4 Aircraft 1:47th to 1:24th scale:** 1st P-51D 'Big Beautiful Doll', Terry Scott; 2nd F-14 Tomcat, P. Morrison; 3rd Seversky S2, C. Pearson.

**AC5 Aircraft Vacuform and Scratchbuilt:** 1st Armstrong Whitworth Argosy, Vic Cook; 2nd Air-speed Ferry, Tony Wollett; 3rd Navywright NW-1 'Mystery Racer', Alan Clark.

**CT1 Civil Transport (Kit):** 1st Lotus 99T, Tony Bourke; 2nd Renault R360 Unit and Trailer, A. Sinclair; 3rd Modified Ford 31A Van, A. Sinclair. **Junior:** 1st Ferrari Testarosa, D. Cooper; 2nd Renault 5, T. Stanley.

**C2 Civil Transport (scratchbuilt):** No entries.

**D Diorama:** 1st Ju 87D Mainten-

ance, Terry Scott; 2nd 'S Sugar comes home', Keith Rogers; 3rd Protector of the Golden Swan, Simon Hart. **Junior:** 1st Peace for Galilee, Adam Bartlett.

**F1 Figure (Foot) 59 mm and smaller:** 1st Napoleon III and Empress Eugene, G. Illsely; 2nd 13th Legionnaire Bie Hakiem, G. Joslyn; 3rd Grenadier 26 Regt USMC, G. Joslyn. **Junior:** 1st Soldier Tamiya, A. Bartlett; 2nd Soldier Tamiya, A. Bartlett; 3rd Soldier Tamiya, A. Bartlett.

**F2 Figures (Mounted) any scale:** 1st French Trumpeter, J. Cristophe; 2nd Sergeant Ewart, K. Ives.

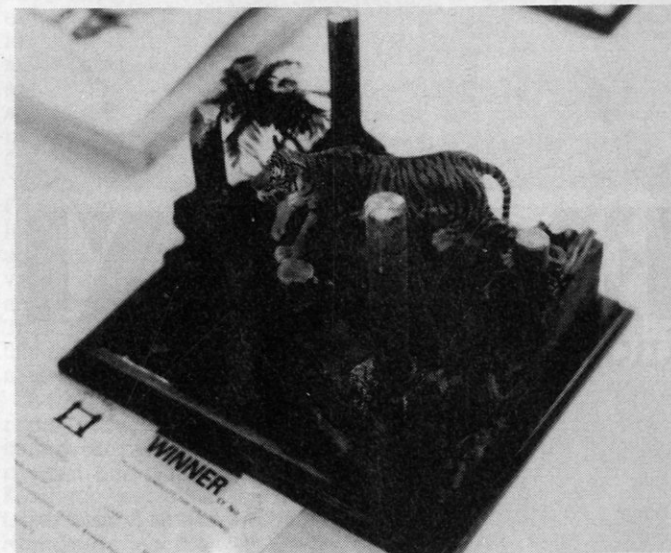
**F3 Figures (Foot) 60 mm and larger:** 1st Coming Home, E. Mirfin; 2nd Marquise De Sevigne, G. Illsely; 3rd Warlord, E. Mirfin.

**F4 Figures (SF and Fantasy) any scale:** 1st The Creature, A. Coleman; 2nd The Fairy, G. Mirfin; 3rd Ride the Lightning, S. Hart.

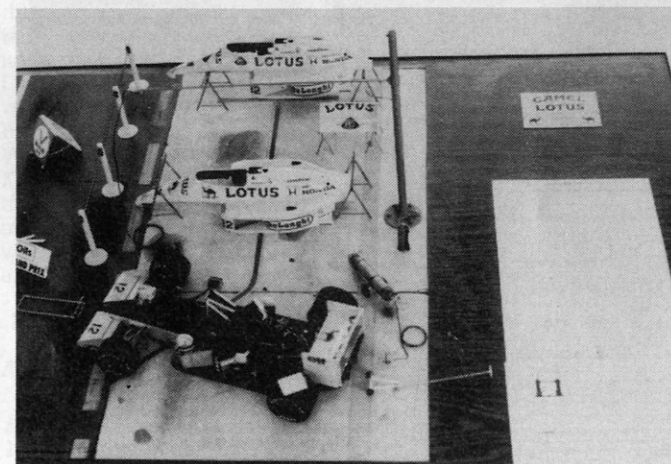
**SF Sci Fi Hardware:** 1st Chaos Destructor, F. Gray; 2nd Shado Mobile, C. McKee; 3rd Scoop, R. Loupart. **Junior:** 1st 23rd Century Artic Soldier, C. Oakley.

**S Ships:** 1st HMS Llandudno, M. Cooper; 2nd Krivika I, J. Shields; 3rd British Powerboats HSL, C. Pearson. **Junior:** 1st Revenge 1577, I. Green.

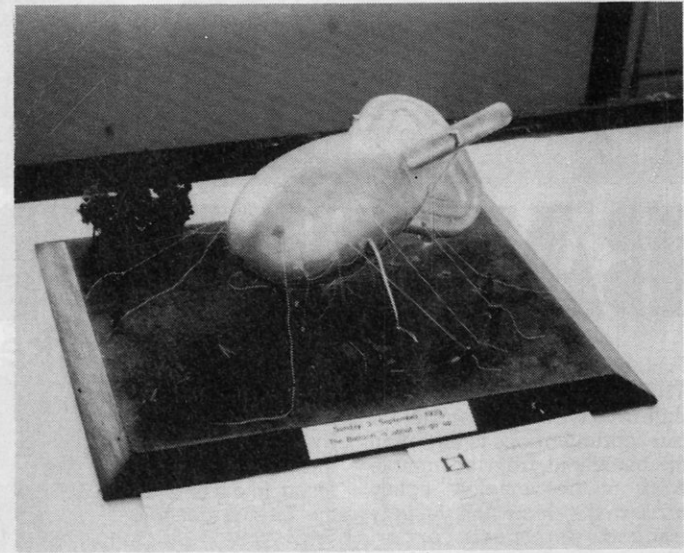
**M. Miscellaneous:** 1st Bengal Tiger, G. Illsely; 2nd British Naval Cannon, P. Jones; 3rd 'Don't be a sitting duck', L. Cooper.



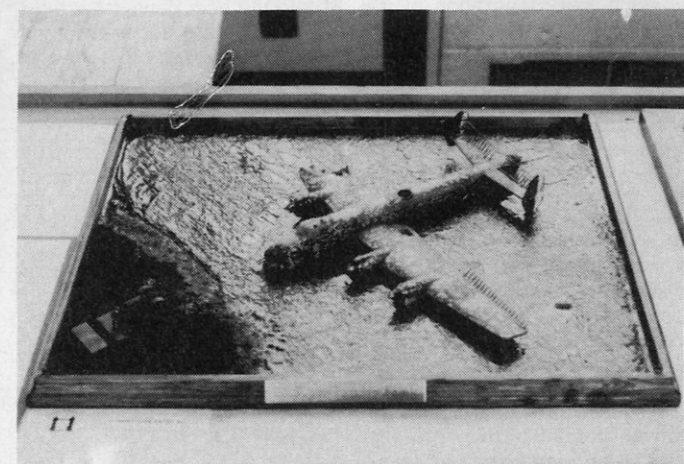
Above: Bengal Tiger by Geoffrey Illsely. Below: 'Best in show' by Tony Bourke.



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Above: 1939 Award 'The Balloon is about to go up' by Eric Cross. Below: 'S Sugar comes home' by Keith Rogers.



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# BATTLEFIELD TAXI

By Mike Ingram

THE British Army has many different types of vehicle for transporting troops to and from the battlefield, from the humble truck to the wheeled, lightly armoured vehicle and the fully tracked personnel carrier. Most numerous of these is the FV 432 Armoured Personnel Carrier, but over the last two years a new generation of infantry carrier has been entering service that for the first time allows the infantry to hit back. It is called the FV 510 Warrior Mechanised Infantry Combat Vehicle (MICV).

The history of the Warrior and the FV 432 can be traced back to the 1920s, when after World War 1, the British, French, Germans and Americans began developing lightly armoured, semi-tracked vehicles. Many were little more than tracked trucks. However, the Germans, after designing the successful SdKfz 11 Prime Mover for transporting artillery and as the pioneers of modern

armoured warfare, realised the need for something different. By 1939 they had developed the SdKfz 11 out of all recognition, into what was to become the most famous semi-truck of World War 2, the SdKfz 251.

The three ton SdKfz 251 had been fitted with an angled armoured body that could shield the occupants from most small arms fire and some light shrapnel, although like its contemporaries, it suffered from an open top. Both the engine compartment and the driving positions were equally well protected. The design was so successful that apart from the infantry carrier that could hold up to ten men, many specialised versions, including ambulances, flame throwers and engineers vehicles, were produced.

## AMERICAN DESIGNS

By 1932 the Americans had begun work on their own

designs after purchasing several French-built Citroen-Kegresse semi-tracks. The result was the M-2 gun tractor

and the almost identical M-3 Personnel Carrier. Looking like an armoured box, several variants were built and many

Above: A Warrior at speed during exercise. Below: A good rear view of another Warrior. (Photos: Mainly Military)



A rear threequarter view of the Warrior. (Mainly Military)

remained in service after the war, especially with the Israeli Army.

## ENTER THE BRITS

Since 1922 the British had been developing the fully tracked Light Dragon gun tractor, which, by 1938 had evolved into the now famous Bren Carrier. After the original reconnaissance version came the Carrier Cavalry and this had accommodation for up to six men at the expense of its armour. Their popularity soon led to several manufacturers making versions of their own and in 1940, in an attempt to standardise the design, work began on the Universal Carrier.

Basically an improved Bren Carrier, the Universal Carrier had room for three men and appeared as Artillery Observation Posts, Mortar Carriers and the Wasp flame-thrower. Their popularity was so great that some were still in service in the 1950s.

In 1944 the Canadians began removing the 105 mm gun and its mountings from Priest self-propelled guns, making Kangaroo personnel carriers for the 2nd Canadian Corps in Normandy. As soon as they were proved, the Canadians began looking for another tank to convert. They found the redundant Canadian light Ram tank, which by removing the turret proved ideal and by December of the same year were in service with both the British and Canadians in North West Europe. The Ram Kangaroo became the first fully tracked APC to be used in any numbers by the British Army with many remaining in service after the war.

## POST WAR DEVELOPMENT

After World War 2, develop-

An FV432 during Ironhammer 1988. (Mainly Military)

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land in the late 1960s, those remaining were brought out of mothballs and modified for internal security duties.

Throughout the 1950s the Fighting Vehicles Research and Development Establishment investigated designs for a new fully tracked, armoured personnel carrier. This resulted in the FV 400 series of vehicles and in 1961, after further development, the first prototype appeared called the Trojan although the name was dropped soon afterwards.

Up until production ceased in 1971, four different marks of the FV 432 were built. The early Mk.1 was built with a protruding exhaust on the left hand side and a petrol engine, followed by the almost identical Mk.1/1. Next came the Mk.2 with the exhaust terminating on the roof and the petrol engine replaced by a multi-fuel version. The final design, the Mk.2/2 was the same as the Mk.2 with the addition of an NBC filter unit on the right hand side.

The basic personnel version of the FV 432 has a crew of two (commander and driver), plus accommodation for up to ten fully armed infantrymen seated on benches each side. The FV 432 is basically a steel armoured box on tracks, unlike its American counterpart the M113, which is constructed from aluminium. At the front left hand side is the engine compartment while on the right is the driver. Over the driver's position is a rectangular hatch and the commanders circular coupler, while the main compartment has a side opening door at the rear and a large circular hatch in the roof.

The main armament of the FV 432 is the pintle mounted 7.62 mm L7A2 machine gun on the commanders coupler and smoke dischargers mounted on the front. So as to give the commander some degree of protection, some FV 432s are fitted with a small hand operated turret and fitted with a L37A1 machine gun with extra smoke dischargers on each side. There is also a small observation hatch in the rear. Most of this version are based in Germany with No.1(BR) Corps, although some can be found in the UK for training purposes.

Since its introduction in 1963 almost 3,000 FV 432s have been built making it the most numerous of all tracked vehicles in the British Army. Like its predecessors, a wide variety of variants have been built for an equally wide variety of roles, some being so specialised they are classed separately.

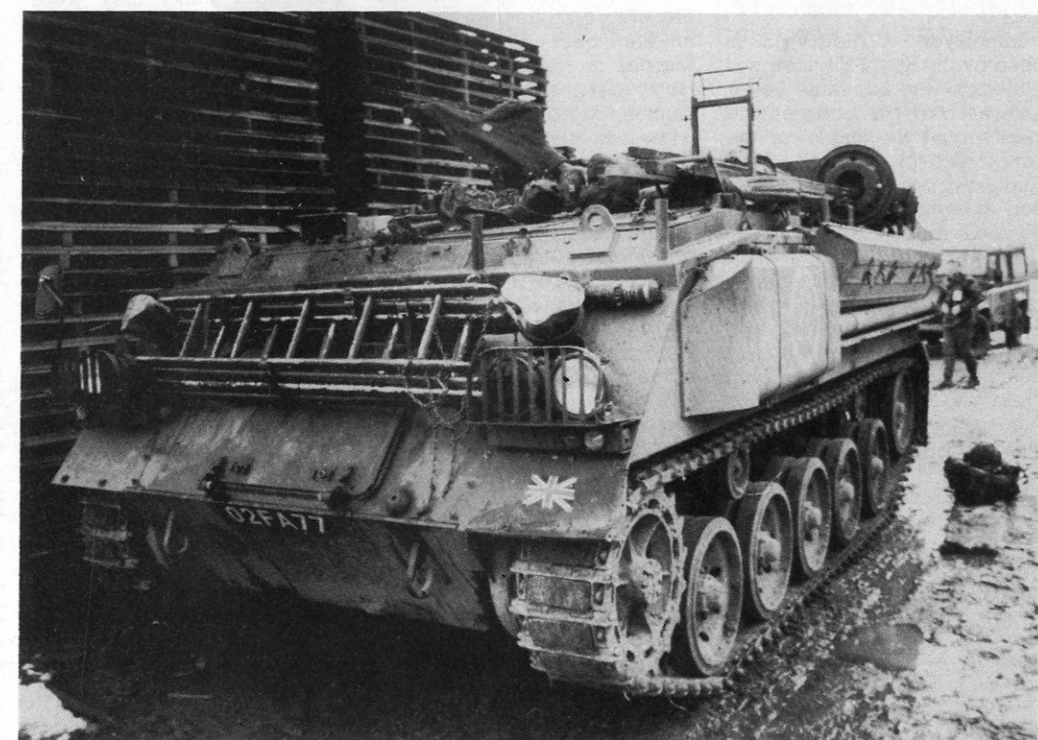
Apart from the basic carrier, the main versions are as follows:

**Command Vehicle** — Crew of seven. Rear or side fitted collapsible penthouse and the interior is fitted with extra radios and map boards. It can also be fitted with a variety of airdrops.

**81 mm Mortar Carrier** — Peculiar to the infantry, this version is fitted with the L16A1 mortar mounted on a 360 degree turntable, firing through the roof hatch.

**Ambulance** — By removing the seating this type can hold up to four stretchers, or alternatively five walking wounded.

**30 mm Raden Turret** — For troop trials several FV 432s







An FV432 ambulance. Note the lack of stowage. (Mainly Military)

were fitted with turrets similar to those on the Fox armoured car. They are now exclusively found in the Berlin Garrison.

**Recovery** — Fitted with an internal winch and a spade at the rear. This type is little used in favour of the FV 434.

**FACE** — The Royal Artillery variant carrying the Field Artillery Computer Equipment.

**Cymberline** — Another Royal Artillery version, this time carrying the Cymberline mortar locating radar. It has a distinctive aerial on the roof and the interior fitted to carry all the associated electronics.

**Sonic Detector** — Used for detecting enemy artillery, it can pinpoint a position within 50 metres up to 10 kilometres away.

**Minelayers** — The FV 432 is used by the Royal Engineers to either tow the Bar Mine Layer with a conveyor between the vehicle and the trailer, or the roof-mounted Ranger Anti-Personnel mine launcher. They can also tow the Giant Viper mine clearing system.

**FV 434 Carrier Maintenance Full Tracked** — This specialised variant equips REME Light Aid Detachments. The main recognition features are a two piece jib crane and an open back which is usually covered with a canvas tilt.

**FV 433 Abbot** — This was the first specialised variant to enter service but bears little resemblance to the original, mounting an L13A1, 105 mm gun in a large turret. Since its introduction, it has been the main self-propelled gun of the British Army, although it is now considered dated and a replacement is being sought.

**FV 439** — is the Royal Signals Mobile Radio Relay version,

apart from the radio equipment, it is fitted with a large collapsible aerial and extra stowage bins.

#### TACTICS

Although highly mobile, the light armour, slow speed and lack of firepower dictates the battlefield tactics of the FV 432. Infantry have to dismount and fight while the vehicles retire to a relatively safe position until required again. The Germans recognised these problems and after many years development introduced the Marder MICV in 1971. Although the Russians had been fielding similar types of vehicle (BPM 1) for several years, it was the first of its type to enter service in the west. Basically the Marder is an armoured infantry carrier with a 20 mm cannon externally mounted on a two man turret and fitted with a power operated ramp. The Americans soon followed suit with the M2/M3 Bradley, although because of a variety of problems it did not enter service until 1981.

At about the same time as the Marder was entering service, the British began to look for a suitable MICV design of their own. It took until 1978 for the project definition to be completed and it was not until two years later that the first prototype appeared called the MCV-80. By 1987, the first vehicles began to enter service under the official title of the FV 510 Warrior.

The 1st Battalion Grenadier Guards were given the honour of becoming the first fully equipped Warrior unit last year. It is also of interest to note that the Grenadiers have also

had to change their role from mechanised to armoured infantry and are the first Guards unit to become an armoured unit since the Guards Armoured Division was disbanded after the end of World War 2.

Unlike its predecessor, the Warrior has an all aluminium alloy body that can withstand heavy armoured piercing machine gun fire and up to 155 mm shell splinters. The alloy body also adds to its speed and agility (in excess of 45 kilometres per hour over difficult terrain), allowing it to keep up with the MBTs. In fact during trials in 1984, MCV-80s were actually overtaking the Challenger tanks they were supporting.

In the Warrior's two man turret is mounted a 30 mm Raden cannon, which is capable of knocking out lightly armoured vehicles, such as other personnel carriers. This means that for the first time the tanks can concentrate on their main role of attacking enemy tanks. The Warrior is also fitted with a 7.62 mm Chain Gun as secondary armament. Unlike the Bradley, the FV510 has no fireports for the infantry, although there are roof hatches that would be closed down while it is in action.

The size of the turret basket means that the Warrior is restricted to carrying a section of seven men, seated on bench seats, three one side and four the other. Unlike the cramped interior of the FV 432 there is also adequate space for all the equipment the infantrymen have to carry. Considerable thought has gone into the occupants comfort as the Warrior's fuel supply is capable of lasting

up to 48 hours without replenishment, meaning the troops might have to endure long periods inside the vehicle. The NBC system is designed so that the occupants have no need to wear protective suits while inside. It also carries enough stores to last the duration and has onboard cooking and toilet facilities.

Spending so much time in the vehicle means that the infantry would be subjected to prolonged vehicle movement such as jolting especially while cross country. To alleviate this, the FV510 is fitted with torsion bar suspension that is designed to even out the bumps for a more comfortable ride. Until now internal vehicle noise has always been a problem in personnel carriers. To enable the occupants of the Warrior to freely communicate without difficulty and reduce noise, it is fitted with Active Noise Reduction (ANR) headsets.

The vehicles crew consists of a driver, gunner and commander. The driver sits forward and to the left in a compartment designed for maximum comfort, while the engine is on the right. The commander, who is also the Section Commander and the gunner both sit in the turret. Vision for all the crew is aided by image intensifiers and thermal imagers as well as wide vision periscopes for use when the vehicle is closed down.

#### THE FUTURE

As to the future of the Warrior, over 1,000 vehicles have been ordered for the British Army. It will not replace the FV 432 for many years. Even the aforementioned Guards Battalion still has large numbers of FV 432s in its ranks. It is intended that the Warrior will eventually have several variants, although perhaps not as many as its predecessor. So far, a Command Vehicle has undergone trials and a prototype Recovery and an Artillery Observation Vehicle have been built.

Apart from wargame models there are, as yet, no Warrior kits on the market. There have been several resin FV 432 kits released over the last few months, with more likely to appear over the next year and these include the Abbot and the FV 434. Some of the older type of APC mentioned such as the Humber 'Pig' and the Saracen, as well as the Russian BMP-1 are also expected to be released.



## THE 'O' GROUP

FOR me the greatest disappointment this month came with the new 1:35th scale releases from Esci, which arrived on the doorstep a few days ago. The carton contained the long-awaited T-72 and T-74 kits, along with a re-released Demag one ton half track. First to be opened was the T-72, but on viewing the contents my initial enthusiasm was quickly dispelled. The kit has been simplified to such an extent that the purist would need to rebuild much of the top hull from scratch to produce an accurate model. However, a less exacting modeller could improve the model considerably by filing the fuel tanks and side stowage bins to the correct rounded edge, as shown on the superb box art. The T-74 is, in fact, a T-72M, with added side skirts and smoke dischargers. In contrast to these very simple kits is the SdKfz 10 Demag half track artillery tractor. This kit was first released some years ago, but nevertheless it is a very nice little model. The box carries the 'Link by Link' logo, but only the old vinyl track is

Accurate Armour's resin T-34 wheels.

provided. Included in the box are 14 polythene soldiers in seven different positions. If Esci want their 1:35th scale range taken seriously, then I would suggest they make an effort to improve quality up to the standard of their current

1:72nd scale aircraft and military vehicle ranges. The T-72 and T-74 cost £11.99 each.

#### RESIN KITS

Sovereign Miniatures has now released its 1:35th scale

Armor Research's and Verlinden's latest products.

StuG III Ausf C/D. This is a resin kit with white metal parts and the quality is well up to this company's high standards. The StuG III Ausf C and D were built from mid-1941 and served almost exclusively on the Eastern Front. This is Sovereign's first attempt at a tracked vehicle and the resulting model is very good, indeed with the tracks being especially well cast. The kit costs £35 and is available from Historex Agents, 3 Castle Street, Dover, or from any of the larger specialist model outlets.

LR Models sent me a parcel of their latest offerings from MB Models and Verlinden. The ISU-152 from MB Models came as quite a pleasant surprise after examining some of the earlier releases from this American company. Gone are the simple amateur castings with only the box top illustration as a construction guide. This latest kit is well cast in polyurethane resin and comes with a full instruction sheet and a Steve Zaloga drawn 1:35th scale plan of the subject vehicle. These castings are the best I have seen on any resin kit coming from the US and now hold their own against any of the best British and European produced kits. Along with the ISU-152 came the similar ISU-122 tank destroyer and the IS-2 'Stalin' tank. New from MB for 1989 are the Komsomolets artillery tractor, a T-62 engine and the T-28 medium tank.

#### VERLINDEN

Verlinden have accursed their 17 pounder 'Firefly' turret and the model now has the correct



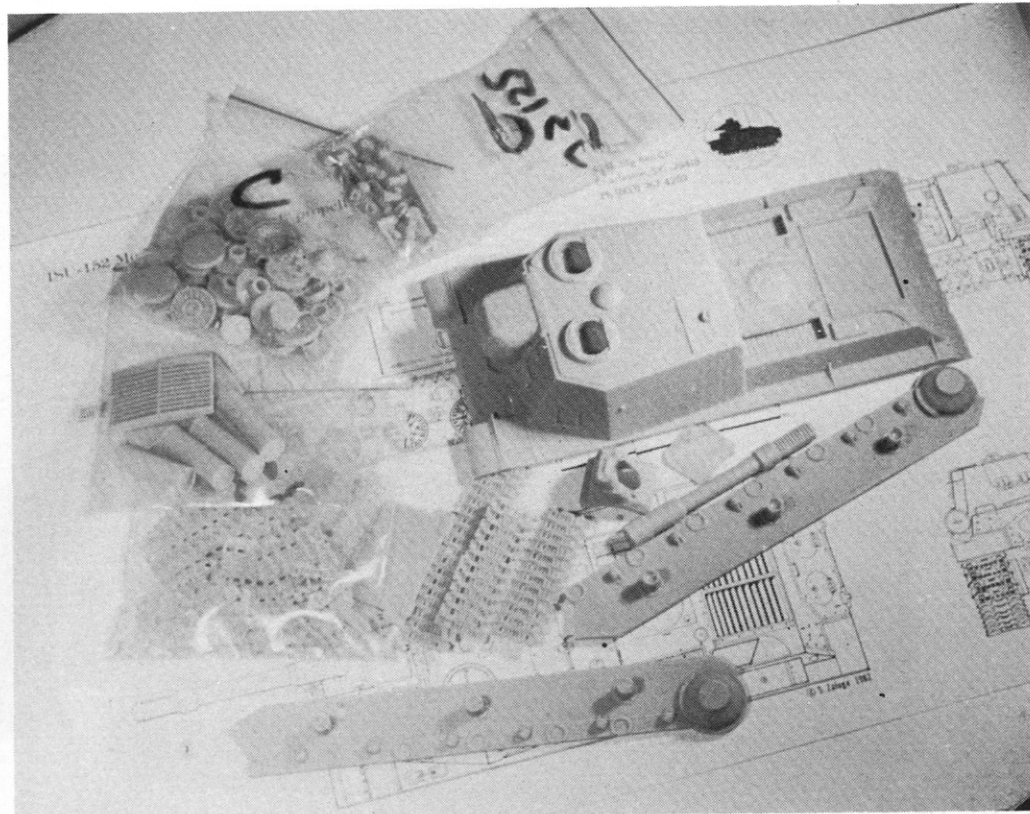


turret bustle. New releases also include: No.386 — US Army portable refuelling unit; No.390 a USAF fighter 'Jock' circa 1980s; No.393 is three multipose GIs from Vietnam and lastly, No.395 is a Vietnam vignette named 'Hamburger Hill'. Prices are £4.50 for the pilot, £6.50 for the multipose figures and refuelling set and £8.50 for the vignette. For more details contact Richard Pike on 021-420 4332, or write to LR Models, 359 Bearwood Road, Bearwood, Warley, West Midlands B66 4DB.

ED Models informed me that they are expecting deliveries of the new 1:35th scale ADV kit of the 8.8 cm Pak-43 anti-tank gun. The DUKW announced by this company some time ago is still on the cards for this year, but has been delayed due to problems with the castings. I did, however, receive some 1:35th scale detail accessories from the American company Armor Research. These include ammunition for the US 76 mm gun, one set is the M-79 AP shot and the other is the M-42A1 HE shell. Both were used by the M-4A1 76(w) and M-4A3 76(w), the M-10 and M-18, though the tank destroyers normally used the M-93 HVAP round. Each pack contains 20 pieces.

The next sample was a similar set of German 7.5 cm KwK.40 APCBC ammunition for the Panzer IV Auf F-J. Sets of 50 inch calibre ammunition boxes are also available in both white metal and brass photo-etched parts. These are all good quality items, though looking at the photo-etched parts I would only recommend them to the more experienced modeller as they are quite fiddly to construct. For more details and the latest prices contact Andrew Deeley on 021-744 7488, or write to ED Models, 64 Stratford Road, Shirley, Solihull, West Midlands B90 3LP.

Accurate Armour has now released some road wheel sets for the Soviet T-34/85, SU-100, SU-85 and some late T-34/76s. Set No.1 is the semi-webbed pierced type with the unperforated rubber type, similar to the 'spares' found in the Tamiya T-34/76 1943 kit. Set No.2 is the fully-webbed perforated type which first appeared about mid-1942. I have always found these road wheels far more attractive than the plain 'dish' type or the all-steel wheels found in the Tamiya kits. The sets cost £8.95 each, or £19 if purchased with a Tamiya T-34/85. The next full kit from this company will be the Soviet PT-76 amphibious light tank, though there are some other



goodies in the pipeline which I have been asked not to announce until production details have been finalised.

Derek Hansen would appreciate it if customers would check by telephone the availability of new kits, rather than send letters and cheques which take time to answer. As with all small-scale producers time spent in the office is time spent away from production. The number is (0475) 43955. Orders for kits in production can be sent to Accurate Armour, Unit 16, Ardgowan Street Industrial Estate, Port Glasgow PA14 5DG.

#### WHITE METAL KITS

From MMS will shortly come a 1:72nd white metal kit of the BMP-1P Soviet MICV. The price on this kit is £8.95 which is in line with other variations of this popular vehicle which are already in the shops. You can buy this range of kits, which include T-72s, BRDMs and several other Warsaw pact vehicles, direct from MMS, 26 Crescent Rise, Luton, Beds LU2 0AU. Minimum order is two kits, which are despatched post free. MMS kits are also available from Pegasus Models, 297 Allison Street, Glasgow G42 8AH for those wishing to purchase single items.

Dorking Models offer white metal 10 cwt GS Mk.II Mortar Trailer in 1:35th scale. This is a nice little model in its own right, but can be used in conjunction with the Chevrolet 15 cwt truck, Universal Carrier, Jeep or Half

Track. It was used during World War 2 as a carrier for the larger mortars, the Vickers MMGs as well as for ammunition and supplies. This trailer was eventually replaced in the mid-1950s by a new range in the ¼ ton class. The price is £7.99.

Also from Dorking Models, under the 'Mole' trade name comes a set of HVSS suspension and T-62 track for the late M-4 series and late type Maultier road wheels with four circular perforations. The shop stocks the Czech Tonda and Dutch Perry ranges of 1:35th scale vacuform military vehicles. Perry concentrate on the Sherman series, with kits of the M-4, M-4 Composite, M-4A2, M-4A3 and M-4A4 and a Firefly/105 mm turret conversion. Tonda produce World War 2 Soviet vehicles and conversions. For more details write to Tony Lawrence at Dorking Models, 12-13 West Street, Dorking, Surrey. Telephone (0306) 881747.

Miniature Military Models hope to soon have their 1:35th scale M-114A1 kit ready for production. The M-114A1 was an American reconnaissance vehicle which shared several features of the larger M-113 APC. Some vehicles were sent to Vietnam, but were not very popular or effective and were soon replaced by the M-113A1 ACAV. Also in the pipeline are conversion sets for the Italeri M-47 kit. The first of these is an M-26 Pershing which was used by the US Army in the closing months of World War 2 and again in the Korean War. The

second is the M-46, a re-engined post war variant, which also saw action in Korea.

#### OTHER NEWS

From the USA I received a sample of some 3M acryl-red putty, part No.051144-05966, which I believe is normally used for car body repairs. This is a nitrocellulose base filler specially designed to fill pin holes and scratches. However, it is ideal for filling holes and joints in plastic and resin models. It looks and smells similar to Squadron 'Green Stuff', but when dry is tougher and much finer textured. I used it to fill air bubbles and part of a finely cast splash guard which had chipped off in several places. The result was perfect and I was able to rub down the putty to a fine edge such as in the case of splash guard repair. This quality also means its can be used on edges and rims with a large degree of success. This is the best filler I have used and the huge 21 oz tube should last me many years. My sample was sent by Aardvark Hobbies, but other 3M products are sold in the UK, so there is a chance you may find this filler in your local motorists supermarket.

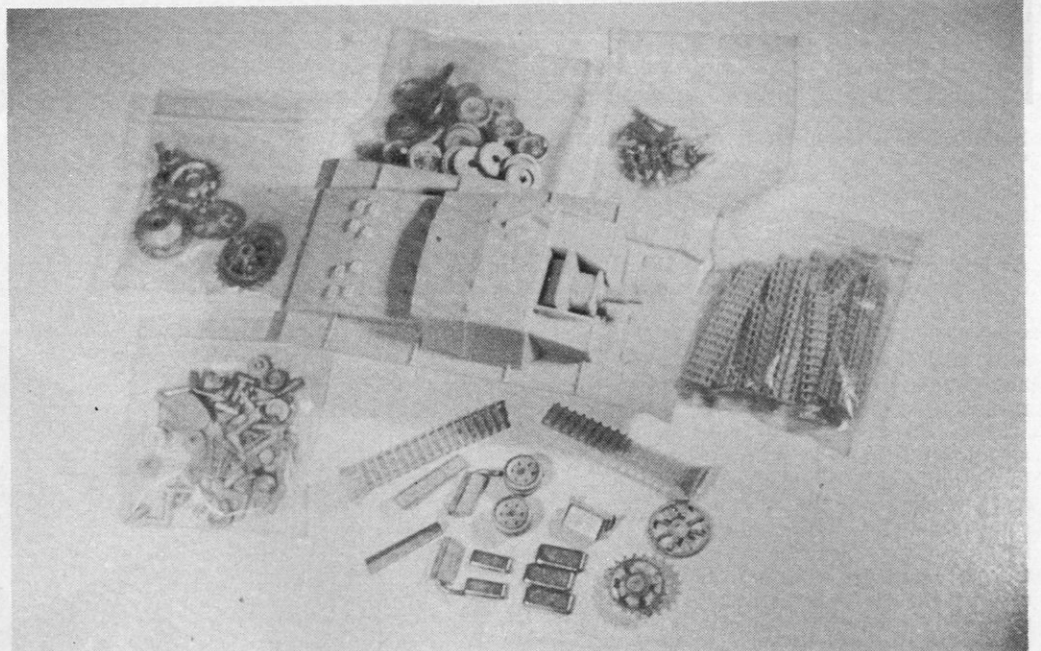
Mr Yoshio Ohwada sent me a list of new releases from Model Kasten, in the form of 1:35th scale injection moulded tank tracks to fit Tamiya and Italeri models. There are three sets: M-4 Sherman, Japanese Type 97 Medium and the Italian M39/40 Medium tank. Mr Ohwada runs a model import-

#### Sovereign's StuG III Ausf C/D.

export business, selling some British kits such as Accurate Armour on the Japanese market, but will also supply some Japanese products such as Sunny 1:76th scale kits and Model Kasten via mail order to overseas customers. For lists send International reply coupon to Mr Yoshio Ohwada, 5-12-69-1017 Yashio, Shingawa-Ku, Tokyo 140 Japan.

Cromwell Models are busy re-tooling many of their older kits in 1:76th scale to improve the quality up to the latest standards set by this company. The changes mainly concentrate on the trackwork and wheel assemblies, which are greatly improved on the later models by a new method of casting. Most of the models now being modified are Soviet vehicles, including the T-54/55, Shilka and PT-76. The models are available from Cromwell Models, Regency House, 22 Hayburn Street, Glasgow G11 6DG.

Lead Sled produce models in 1:76th, 1:72nd and 1:48th scales and though most are airfield accessories, a growing number of military vehicles are also being produced. These include the Humber 4 x 4 and



Ford WOA2 heavy utilities, Humber ambulance and the Austin light utility. Shortly to be re-released is the AEC Dorchester ACV and a Marmon Herrington armoured car. Both these vehicles were used in the Western Desert by the British Army, with the Dorchester armoured command vehicle being used later in Italy and

North West Europe. The models are cast in white metal, one of the harder alloys and are to a very high standard.

For further information send an SAE to David Cass, Lead Sled Models, Round House Craft Centre, Buckland-in-the-Moor, Ashburton, Devon TQ13 7HN. Lead Sled also stock the David Jane series of military

vehicle plans in 1:35th and 1:76th scales. There are 30 plans covering British, German and American soft skins of the World War 2 period. Many of them are useful for converting Tamiya and Italeri kits. The 1:35th scale plans cost 65p each and the 1:76th scale are 45p.

Phil Greenwood

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# KIT COMMENT

## SLINGSBY VENTURE T.Mk.2

**Manufacturer:** Aero 72  
**Scale:** 1:72nd  
**Price:** £4.25

A MODELLING enthusiast once commented to me that if anyone makes kits of machines that don't kill people, they won't sell. That may be a bit of an exaggeration, but I'll just bet it tends to be the truth.

I certainly hope that this axiom won't prove to be true for Aero 72 as I feel that civil and training aircraft are a subject that has been ignored for far too long. Sooner or later the manufacturers will run out of warplanes to do or simply tire of the seemingly endless stream of Phantoms and Spitfires. The Slingsby Venture may be unknown to our international readers, but it is well known to those future RAF air-men who are involved in this country's Air Cadet programme.

The kit is a simple one that includes only seven injection moulded and six white metal parts. The kit also contains a vacuform canopy, the best type for this kind of kit and a decal sheet that contains markings for one aircraft. The construction



was a snap as the parts fit quite satisfactorily and I found that the model was ready for the first coat of paint after an evenings labour. I

used a minimum of filler putty and truly enjoyed the task of completing such a basic kit for a change.

This is a kit that can be

tackled by modellers of all skill levels and one that is bound to be a good seller among the Air Cadet ranks.

**J.W. Patterson**



## ANTONOV An-14

**Manufacturer:** VEB-Plastikart  
**Scale:** 1:72nd  
**Price:** £8.95

It is always a wonder to me to

AIRFIX MAGAZINE — PAGE 424

see kits to 1:72nd scale emerging from behind the Iron Curtain. I am probably intrigued with the thought of the limited choice of model kits that must be in their shops and the

tremendous devotion to the plastic modelling hobby that they have to possess. We here in the western world are jaded in that the products of most industrial nations are relatively

easy to obtain. Not so jaded, I might add not to fully appreciate adding an interesting aircraft such as the An-14 to my collection.

This is a well moulded and easy to make kit. The parts all fit quite well and require only a minimum of filling during assembly. The kit is moulded in three colours and the window part cleverly includes the internal flooring and seats. Unusual for VEB, is the inclusion of many smaller details such as the control surface actuator horns.

The decal sheet is huge and includes markings for no less than three aircraft. Two Soviet types, one military and the other a civil Aeroflot version. The third version is an East German camouflaged type. While these are printed to a standard not quite state of the art, they are usable.

The kit was easy to build and is recommended for all skill levels. While I am not as familiar with the type, I would imagine that it offers the possibilities for a wide variety of colour schemes, particularly for the air forces of all the Eastern Bloc nations.

**J.W. Patterson**

MAY 1989

## ILYUSHIN Il-2m3 or Il-2

**Manufacturer:** Mikro 72  
**Scale:** 1:72nd  
**Price:** £3.99

THIS Polish entry into the plastic melee may not be that new to some of our readers, but it was new to me. The other 'Stormoviki' kits on the market by Airfix and KP of Czechoslovakia have been around for a while, so that discovery of this box was a real revelation to me.

In the past, Mikro has produced kits of primarily Polish aircraft and as this kit contains markings for the Polish Air Force, it is consistent with their past efforts. The kit is well moulded in white plastic and includes parts for two versions of the Soviet equivalent of the German Stuka.

The kit was very easy to build and presented only one problem area. That was the addition of the top part of the engine cowl, which didn't fit all that well. A little filing and fitting quickly rectified the situation and the balance of the kit was really little more than a drill. I chose to model the single seat Il-2 version as it has a rather bizarre appearance in that such a large aircraft looks

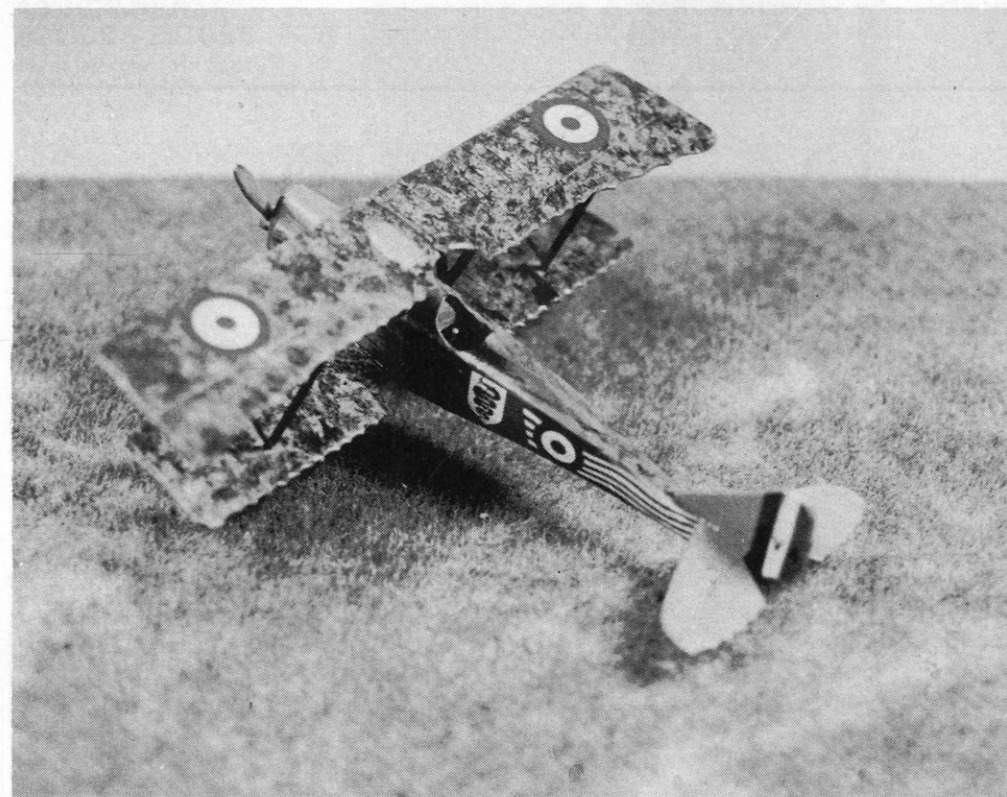
so with such a small canopy.

The kit offers five different colour schemes on the decal sheet which is one of the best I've ever seen in an Eastern kit.

Overall the kit is good value and I must say that it has inspired me to purchase a couple more to add to my recently growing Russian collection.

This is a kit that any modeller can complete and would add a historically significant aircraft to anyone's model collection.

**J.W. Patterson**



## ANSALDO SVA.5

**Manufacturer:** Pegasus  
**Scale:** 1:72nd  
**Price:** £4.40

WORLD War 1 aircraft fans have had to wait a long time for this attractive Italian biplane.

The major manufacturers have never thought that it was a commercially viable subject and we modellers have had to suffer this fact. There once was a vacuform kit or two available, but for the more timid among us, these were not really

appropriate.

Pegasus has now given us all the opportunity to include, what could arguably be the most attractive World War 1 fighter, to our collections.

The kit contains 13 injection moulded parts that are of a

commendable quality for a limited run kit. The kit also contains two white metal machine guns. Unfortunately the struts have been omitted and you will have to resort to the indispensable Contrail plastic strut material available at most hobby dealers.

The actual assembly of the plastic parts presents no problem as the fuselage halves fit very well and the wings are quite well moulded in single piece remarkably thin sections. The real challenge to the modeller in the construction of this kit is the unusual trussed strut configuration peculiar to some Italian biplanes. The best way to solve this potentially difficult task is, once the lower wing has been firmly dried in place, to secure the upper wing to the fuselage with the cabane struts. After this has sufficiently dried, you may then measure and add the balance of the truss with a relative sense of leisure.

The decal sheet, for a single aircraft, is quite colourful but for some reason, lacks the white band of the rudder stripes. You will have to paint the whole rudder white and add the decal at a later stage.

This is one of the best of the Pegasus range to date and a highly recommended kit, especially for World War 1 fans.

**J.W. Patterson**

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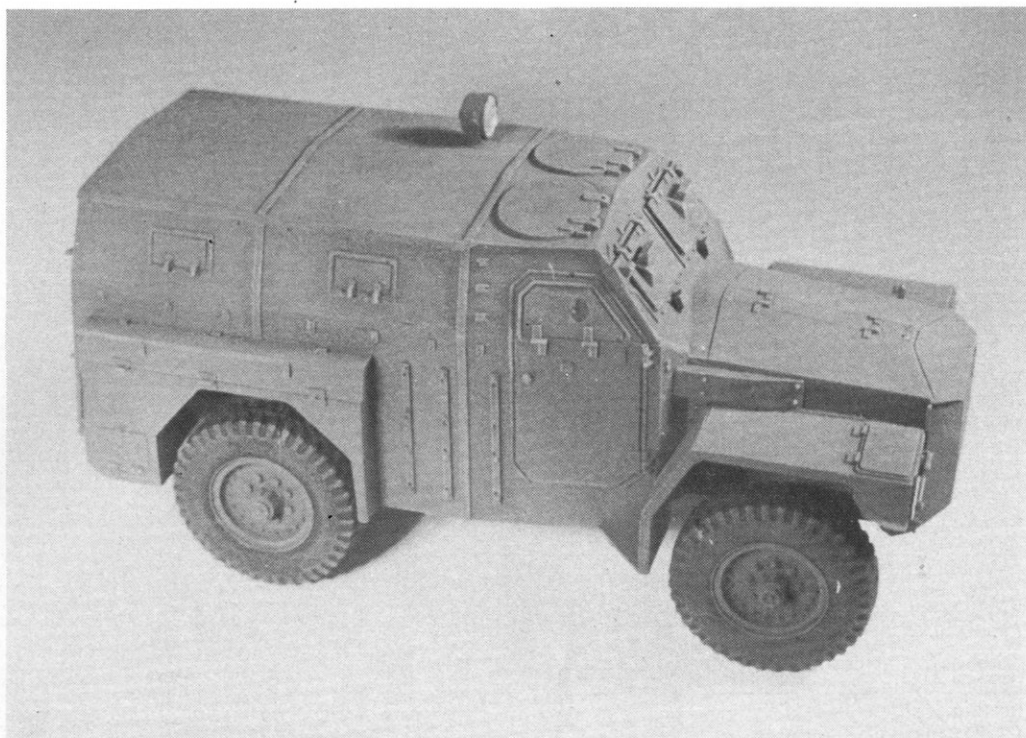


## HUMBER ONE TON ARMoured TRUCK ('PIG')

**Manufacturer:** MMM  
**Scale:** 1:35th  
**Price:** £25.00

THE Humber company built a one ton 4 x 4 general service truck during the early 1950s designated the FV1601. However, due to a shortage of Saracen APCs, the FV1601 was fitted with an armoured body and the resulting vehicle, designated the FV1611, was the first of a series. The basic FV1611 was a load carrier, FV1612 a radio truck and FV1613 an armoured ambulance. The Humber 'Pig' as it is popularly known, entered service in 1955 and was usually supplied to UK and BAOR based armoured and infantry regiments. The vehicle was not popular and though it was only thinly armoured, it was heavy enough to be a very poor cross-country performer. All variants were phased out of service during the early 1960s, but were retrieved from the scrap yards between 1969-72 for use in Northern Ireland.

I am very interested in British armour of all periods, so for me the 'Pig' was most welcome as few vehicles of the 1950s and 1960s have so far been kited. This kit follows the usual Sovereign/MMM formula, resin hull and wheels, with white metal detail parts. The



hull is cast in one piece with no separate doors or hatches, though this does not bother me while those who like to mount figures may be a little disappointed. All the component parts fit well and I had very little advanced preparation to do except for cleaning the white metal parts. The roof rack is optional and I elected to leave it off and save the brass

wire. Four radio antenna bases are provided and these too are optional as the radio car did sometimes carry all four, but most other vehicles carried two, or none at all, depending on their role.

All 'Pigs' were painted in deep bronze green, which was a semi-gloss colour as applied. For this colour you can use Humbrol 75 or HP oversprayed

with a little satin varnish. Markings were the red/yellow RAC flash, or the red infantry flash depending on the type of unit assigned. No markings are carried on vehicles used in Northern Ireland, most of which by now have been up-armoured and fitted out for specialist roles.

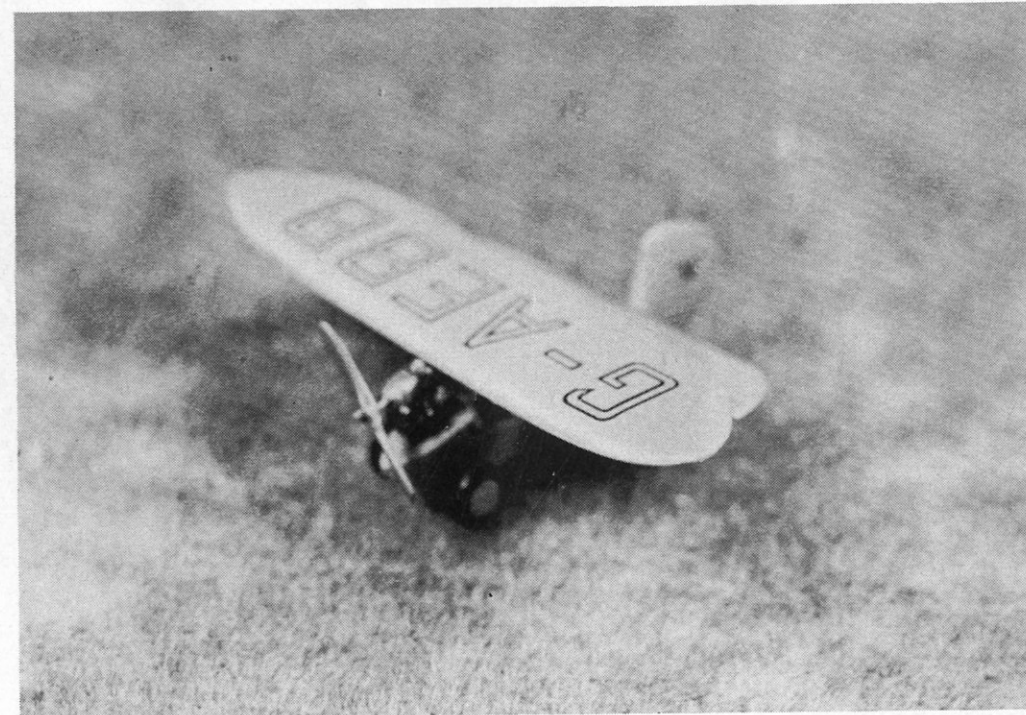
Phil Greenwood

## POU DU CIEL

**Manufacturer:** Aero 72  
**Scale:** 1:72nd  
**Price:** £3.75

THE second Aeroclub surprise at Expo South this year was this little gem and I am glad that I don't have to pronounce its French name which means flea. One gets the feeling these days that the small size of the tools used to produce these limited run kits dictates the choice of subject. While I have been aware of the existence of this lovely little civil aircraft, I certainly would never have imagined that a kit would have ever been produced of one. The Pou Du Ciel was a precursor of today's microlight aircraft that was to have provided private aviators a cheap means to achieve the pleasures of flight. Unfortunately, the events leading up to World War 2 prevented this rather unique design from ever achieving any degree of major success.

Aero 72's diminutive kit is comprised of five injected plastic parts, six tiny metal parts and a decal sheet for one version. The construction does require a degree of skill as the main wing struts must be



scratch built from a thin wire (not provided). The rigging is a necessary item to complete this model, so if you are anxious about performing this kind of procedure, then this model

probably is a good one to practice on as it is a minor task.

This is a kit for average to above average modellers and can be put together in an evening. The resulting model is re-

markably small and would really be a dramatic set piece if displayed beside a large 1:72nd scale civil aircraft on your shelf.

J.W. Patterson

MAY 1989



## MIL Mi-1

**Manufacturer:** WK Models  
**Scale:** 1:72nd  
**Price:** £6.95

WHIRLY-BIRD fans rejoice!

Helicopter kits are always welcome, but historical choppers are even more so. There are a myriad of rotary winged craft that have been ignored by those who produce kits

because it seems that only the newer attack birds have the necessary sales potential. WK Models of West Germany has come to the rescue with this second kit in their new range.

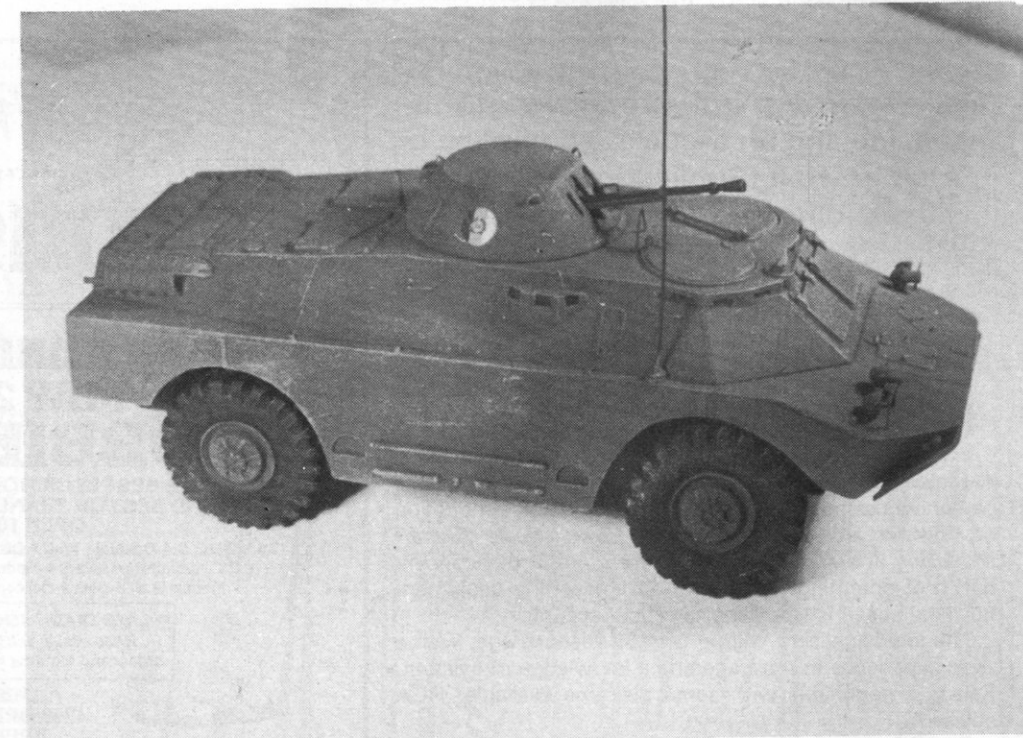
J.W. Patterson

## SOVIET BRDM-2 RECCE VEHICLE

**Manufacturer:** Miniature Military Models  
**Scale:** 1:35th  
**Price:** £25.00

THIS kit is of the early-production model of the BRDM-2, built from 1960 onwards. The type was first seen by western observers during the May Day parade in Red Square held in 1966. By the late 1960s the BRDM-2 had replaced the BRDM-1 as the standard light reconnaissance vehicle of the Warsaw Pact armies. The BRDM-2 and its variants have been sold to no less than 35 countries making it one of the most widely used armoured vehicles ever built.

The MMM kit is cast in polyurethane resin, with some of the small detail parts cast in white metal. Also included is a length of fuse wire to provide the numerous grab handles. I noticed that the hull had a few air bubbles, but these were soon filled with putty. The only other work needed was to clean up the white metal parts and to trim the wheels. Like all MMM kits, this one was easy to build with no hidden vices, taking only two to three hours from start to finish. The two main hatches can be positioned either open or closed and the hull is cut away to allow figures to be mounted without any



surgery. Instead of the fuse wire, I used 20 thou brass rod for the handles positioned around the hull.

All Soviet vehicles are finished in dark green at the factory, this colour is available in the Humbrol range as No.114. However, export vehicles are often found in a variety of local camouflage

schemes, especially those to be found in the Middle East. The BRDM-2 has seen considerable action in the Arab-Israeli conflict, Iran-Iraq war, Angola, Grenada, Cambodia, Chad, Mozambique, Sudan, Ethiopia, Afghanistan and probably several less publicised conflicts. I decided to finish my vehicle as one of the

The USSR recognised the need for such a machine in 1947 and thousands were produced for the Eastern Bloc as well as third world countries.

The kit is a good effort with some problems of fit of the parts but it offers the average modeller no real problems that a little filler putty can't solve. The smaller parts are a bit rough and require some cleaning up with a craft knife or file but overall the kit is worth the effort.

The clear parts barely qualify for the title and could use some polishing up and the decal is basic. As is the case with a lot of newer limited-run enterprises, we can only hope that the accumulation of experience will help them to continually improve their products. I hope that the next WK kit purchases has another more aesthetically coloured plastic than the ghastly green in this one. I really can't complain, as it is streets ahead of the unmentionable brown hue in their first kit.

J.W. Patterson

Phil Greenwood



## 10 cwt MORTAR TRAILER

Manufacturer: Mole  
Scale: 1:35th  
Price: £7.99

THIS little trailer is of World War 2 vintage, but was in use up to the late 1950s with the British Army. It was issued to the infantry for transporting the 3 inch mortar, ammunition or the Vickers MMG, but was often used to carry stores and equipment. The towing vehicle was the 15 cwt truck, but smaller 5 cwt and 8 cwt light utilities could be used to tow the trailer on paved roads.

The kit is cast in white metal, unfortunately one of the softer alloys which meant that some of the pieces were slightly bent. However, they were soon straightened out and prepared for assembly. I used superglue to construct the model while epoxy resins can also be used. I find them rather messy.

There are 28 parts which fit well, though I would recommend a dry run before fixing the pieces. The model took me about two hours to build, once the parts had been cleaned and lightly scraped along the

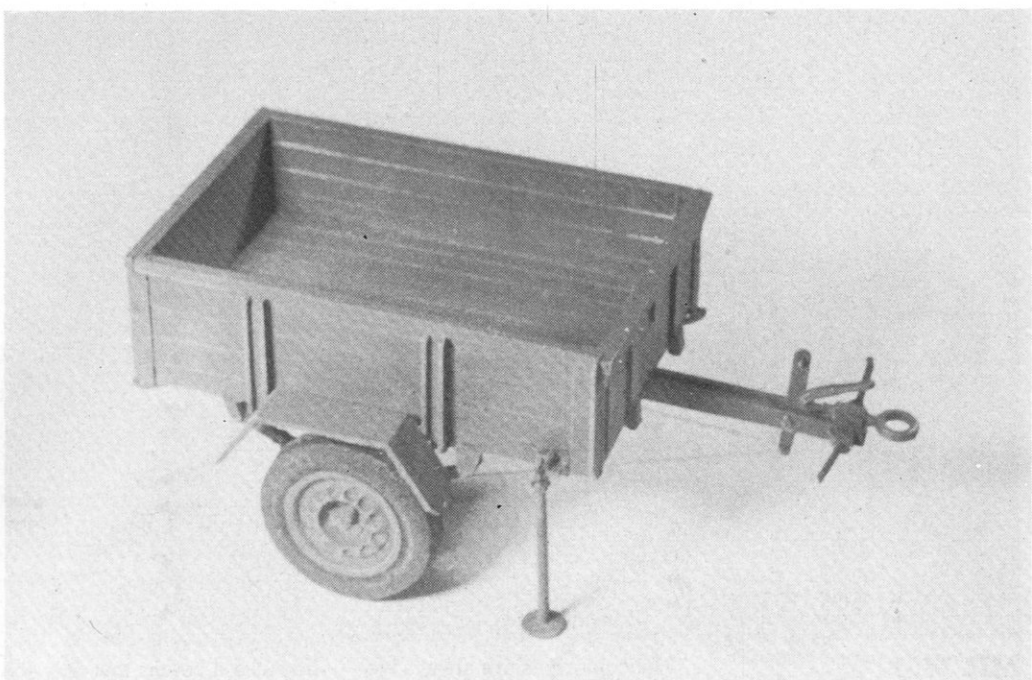
edges were they are to be joined. The handbrake cable can be added from fine wire.

Painting and markings are wide and varied and I gave my model a coat of Humbrol 75

dark green which was probably the most common colour. Unfortunately the only 15 cwt truck so far available as a tractor is the Chevrolet from Italeri. However, the Bedford

15 cwt MWD should soon be available from Sovereign and this would be a far more common towing vehicle, being used from 1940 to about 1960.

Phil Greenwood



## DECALCOMANIA

ALMARK Decals, from ED Models of 64 Stratford Road, Shirley, Solihull, West Midlands B90 3LP, has taken the art of commercial production of model decals one more significant step forward. Their latest four sheets now include colour printed photographs of the subject aircraft in the packet for the modeller's reference. Modeldecals set the standard for the industry by the inclusion of black and white photographs years ago and this latest innovation by Almark should prove an interesting development to observe.

Almark sheet S4 in 1:72nd scale deals with the very colourful Royal Netherlands Air Force 75th Anniversary F-16A while sheet S6 covers both aircraft of the NF-5A 'Double Dutch' flying team and another 75th Anniversary NF-5A. Both sheets are very well researched and printed and offer the modeller the opportunity to produce some truly impressive model aircraft.

The other two new Almark sheets, A48-8 and A48-9, are identical to the aforementioned 1:72nd sheets, but as the numbers imply, they are for the available 1:48th scale kits.

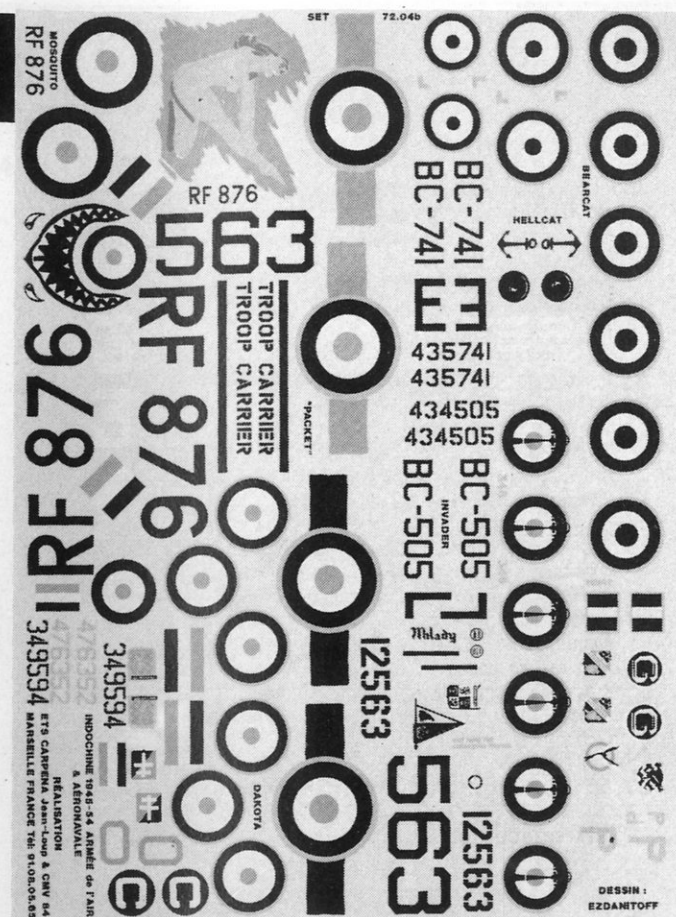
A new name on the decal scene is G Decal of Italy. This is short for Giusti Decalcomanie and they currently produce the fine decals included in the present range of

Esci/Ertl kits. The first two sheets received are packed in a similar fashion to the now out of issue Esci decal series and are not numbered. They both contain a variety of individual aircraft markings that can be used to supplement the decal sheets included in the Esci/Ertl range and currently deal with modern jet aircraft.

One sheet covers French Air Force Jaguar squadron markings, two Italian Air Force F-104G types and USAF F-16Cs. Another covers US Navy F-18As, Canadian F-18As and a series of A-10As. Both sheets are of excellent quality and include colour printed instruction sheets. Overall the package is very good and I believe that the lack of any written documentation is probably due to the fact that they are seeking an international market. The theory being that pictures are worth thousands of words. In any case the colour drawings are adequate to finish a model if ones uses the kit instructions as a basic painting guide.

This brings us to the problem of where to obtain these decals as G Decal are at the present time seeking dealers. My best advice is to wait patiently or simply write to them at Giusti Decalcomanie, Via Sicilia 35, 40060 Osteria Grande (Bologna), Italy.

J.P. Wood



The magnificent Carpena two-part sheet of the French Air Force in Indo China 1945-54 available from Flying High.

Hall Park Press Ltd, producers of this magazine and an associate company of Alan W. Hall (Publications) Ltd are expanding and need extra staff

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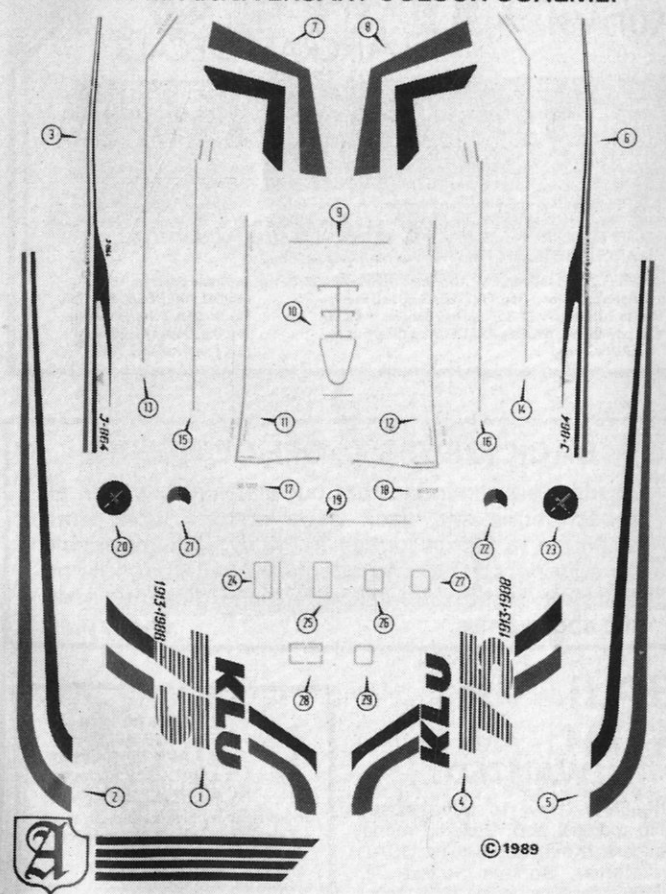
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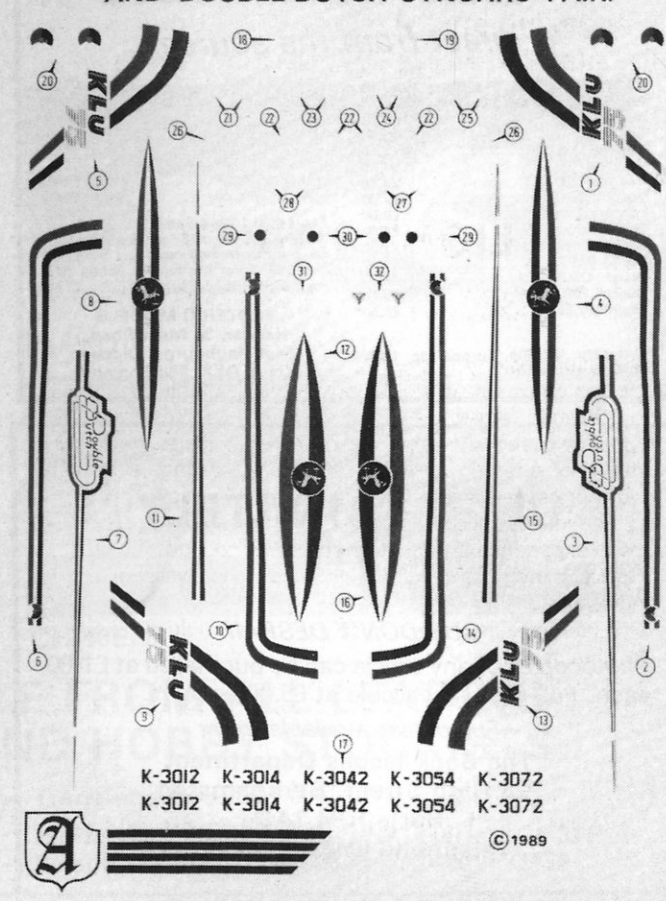
MAY 1989

## S4 F-16A FIGHTING FALCON J-864, 312 SQN. 1 ROYAL NETHERLANDS AIR FORCE, 1988 '72 -75th. ANNIVERSARY COLOUR SCHEME.



MAY 1989

## S6 NF-5A FREEDOM FIGHTERS, 314 SQN. 1 ROYAL NETHERLANDS AIR FORCE, 1988 '72 AND 'DOUBLE DUTCH' SYNCHRO-PAIR.



AIRFIX MAGAZINE — PAGE 429







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Most are contained in back issues but those marked with an asterisk are photo-copied from the originals.

**As from 1 November 1988 the price for all plans will be £1.80 including p&p and VAT**

<b>Royal Air Force</b>		Hawker Typhoon	11/16	DH.9	12/14	* Boeing-Vercel Chinook	12/14	<b>Italian aircraft</b>	
* Short Singapore III	1/3	RAF SE.5a	11/23	RAF BE.2c	12/19	Bell P-63 Kingcobra	12/7	* Aeromacchi MB.326	1/20
* Vickers Wellington	1/6	Blackburn Botha	11/25	Sopwith Dolphin	13/1	Curtiss C-46 Commando	12/16	* Fiat CR.32	2/17
* HS Harrier GR.1/T.2	1/8	Panavia Tornado	12/2	de Havilland DH.2	13/9	Boeing P-26A	12/18	Savoia Marchetti SM.82 Marsupiale	4/1
* Bristol Brigand	1/9	Handley Page Hyderabad	12/5	Sopwith Baby	13/24	Fairchild C-119 Flying Boxcar	12/26	Reggiane Re 2001 Falco II	4/3
* Boulton Paul Overstrand	1/17	* Westland Whirlwind Mk.1-8	12/6	Roland C.II	14/2	* Vultee Vengeance	13/2	Siai Marchetti SF.260	8/8
* Short Stirling	1/18	Percival Proctor	12/9	Platz D.111	14/18	Beech C-45 Expeditor	13/18	Cant Z.1007bis	8/13
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* RAF Aerobatic Teams 1973	2/3	Avro Manchester	12/25	<b>World War 2 Luftwaffe</b>	1/2	* Lockheed C-130 Hercules	15/6	Caproni Ca.313 and Ca.314	10/7
* Handley Page Heyford	2/8	Westland Gazelle	13/4	* Dornier Do 17	1/7	Thunderbolt	13/22	Fiat BR.20 Cicogna	10/12
* Avro Anson Mks.19-22	2/12	Avro Tutor	13/11	* Junkers Ju 86	1/14	Sikorsky H-60	13/23	Cant Z.506 Airone	11/4
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Saro London	3/5	Gloster Gauntlet II	14/15	Junkers Ju 52/3mge	4/26	Sikorsky Hoverfly II	15/14		
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* Westland Wessex	3/21	DH.114 Heron	15/17	Fieseler Fi 156 Storch	10/20	<b>United States Navy</b>		SAAB 32 Lansen	7/24
* Douglas Boston III	3/26	Hawker Horsley	15/18	Dornier Do 335 Pfeil	10/24	* Grumman TBM-3 Avenger	1/12	SAAB 17A-C	14/22
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Vickers Vimy and Vernon	4/10	<b>Royal Navy</b>		Fw 190D-9, Ta 152	12/23	* McDonnell T2H-34 Banshee	2/21		
University Air Squadron colours	4/13	* Westland Wyvern T.3	1/4	Heinkel He 51	13/7	* LTVA F-7 Corsair II	2/23	<b>French aircraft</b>	
Vickers Wellesley	4/16	* Fairey Firefly Mk.1-7	1/5	Messerschmitt Me 262	13/10	* Consolidated PB4Y Catalina	3/11	Dassault Mirage III	6/2
Westland Wagtail and Wallace	4/17	* Westland Scout/Wasp	2/2	Focke Wulf Bf 110	13/15	* Grumman HU-16 Albatross	3/13	Stampe SV 4C	8/8
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* de Havilland Dove and Devon	5/9	* Fairey Albacore	4/6			LTV RF-8G Crusader	4/12	Nieuport-Delage 29	11/26
de Havilland Vampire F.1-T.11	5/11	* Supermarine Scimitar F.1	4/25			Lockheed S-3A Viking	4/15	Nort 2501 Noratlas	12/15
Hunting Pembroke	5/16	Westland Sea King and Lynx	5/7				4/18	Dassault-Breguet-Dornier Alpha Jet/22-2	14/21
* Miles Master and Martinet	5/17	Hawker Sea Hawk F.1-6	5/8			NA T-2 Buckeye	4/20	Dassault-Breguet Mirage F1	14/1
* Sepecat Jaguar GR.1/T.2	5/19	Fairey Swordfish I-IV	6/7			Curtiss SOC Seagull	4/21	Breguet BR 1050 Alize	15/3
Consolidated Liberator with RAF	5/21	Fairey Fulmar 1 and 2	6/20	<b>United States Air Force</b>	1/1	NA RA-5C Flying Quarters	5/1	Breguet BR 1060 Alize	15/3
Short Sunderland I-V	5/26	Blackburn Firebrand	6/25	* North American F-86 Sabre	1/10	Grumman F6F Hellcat	5/15	Morane Saulnier Type 1, N & V	16/4
* Hawker Siddeley Shackleton	6/1	Hawker Sea Fury FB.11	6/11	* Lockheed P-39 Sabre	2/15	Grumman F9F Panther	7/10	Breguet 14A2 and B2	15/13
* Bristol Blenheim I-V	6/3	Supermarine Attacker	7/12	* NA T-38 Sabreliner	2/10	Grumman F9F Cougar	7/15		
HS Buccaneer S.1/S.2	6/4	* Blackburn Skua and Roc	7/16	* Grumman OV-1 Mohawk	2/19	Brewster F2A Buffalo	8/2		
HS. Argosy	6/6	Vickers Supermarine Walrus & Seagull V	9/11	Curtiss P-40 Warhawk	3/7	Lockheed P-2 Neptune	8/15		
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de Havilland Hornet	6/26	Short Sturgeon	14/19	Douglas B-66 Destroyer	6/10	McDD F-4J/S Phantom II	10/22	Ilyushin Il-33 and DB-4	9/19
Westland Whirlwind F.1	7/5	Avro Bison	14/20	NA F-100 Super Sabre	6/12	Grumman F7F Tigercat	11/10	Yakovlev Yak-33 and MiG-3	10/4
Fairey Battle B.1	7/6	Blackburn Dart	15/2	* Conqair B-58 Hustler	6/16	Curtiss Helldiver	11/19	Antonov AN-10A & AN-12	10/10
Westland Puma	7/7			Northrop P-61 Black Widow	6/19	Douglas F3D Skyknight	11/21	Sukhoi Su-2	10/15
Armstrong Whitworth Whitley	7/9			* Republic F-105 Thunderchief	6/21	Ryan FR-1 Fireball	13/3	Mil Mi-24 Hind	11/18
Bristol Beaufort Mk.1	7/13	<b>World War 1 aircraft</b>		Douglas A-26 Invader	7/1	McDonnell Douglas A-4 Skyhawk	13/17	Tupolev Tu-2	11/18
Vickers Vildebeest I-IV and Vincent I	7/14	* Fokker D.VIII	1/11	Lockheed U-2	7/1	Douglas A20-1 Skyhawk	14/7	Tupolev Tu-16 Badger	11/18
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Lockheed Hercules C.1	7/26	* DH.10	3/1	Sikorsky HH-53C	8/6				
Hawker Hunter TT.III	8/1	Brandenburg C.1	3/8	Lockheed Hudson	8/7				
* BAe Hawk T.1	8/4	* Avro 504K and 504L	3/15	* McDonnell F-101 Voodoo	8/10				
* Hawker Hart family	8/5	Nieuport 28C	3/19	Bell P-59 Aircomet	8/14				
Avro Lancaster	8/12	* DH.4	3/25	NA B-45 Tornado	8/16				
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Beagle Bassett C.C.1 and Beagle B.206 9/3	9/6	Sopwith Camel	5/23	McDD F-4E/F/G Phantom II	9/15	Douglas DC-9	3/3	<b>Miscellaneous</b>	
Armstrong Whitworth Albemarle	9/6	Fokker Dr.I Triplane	6/15	Lockheed F-104 Starfighter	9/18	* Airlines of Germany, France and Italy	3/24	* Kawasaki Ki-61 Hien	2/11
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Bristol Belvedere HC.1	11/6							Mitsubishi GAMI-3 Betty	13/2
de Havilland Venom NF.2	11/7							Mitsubishi A6M Zero	14/1
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